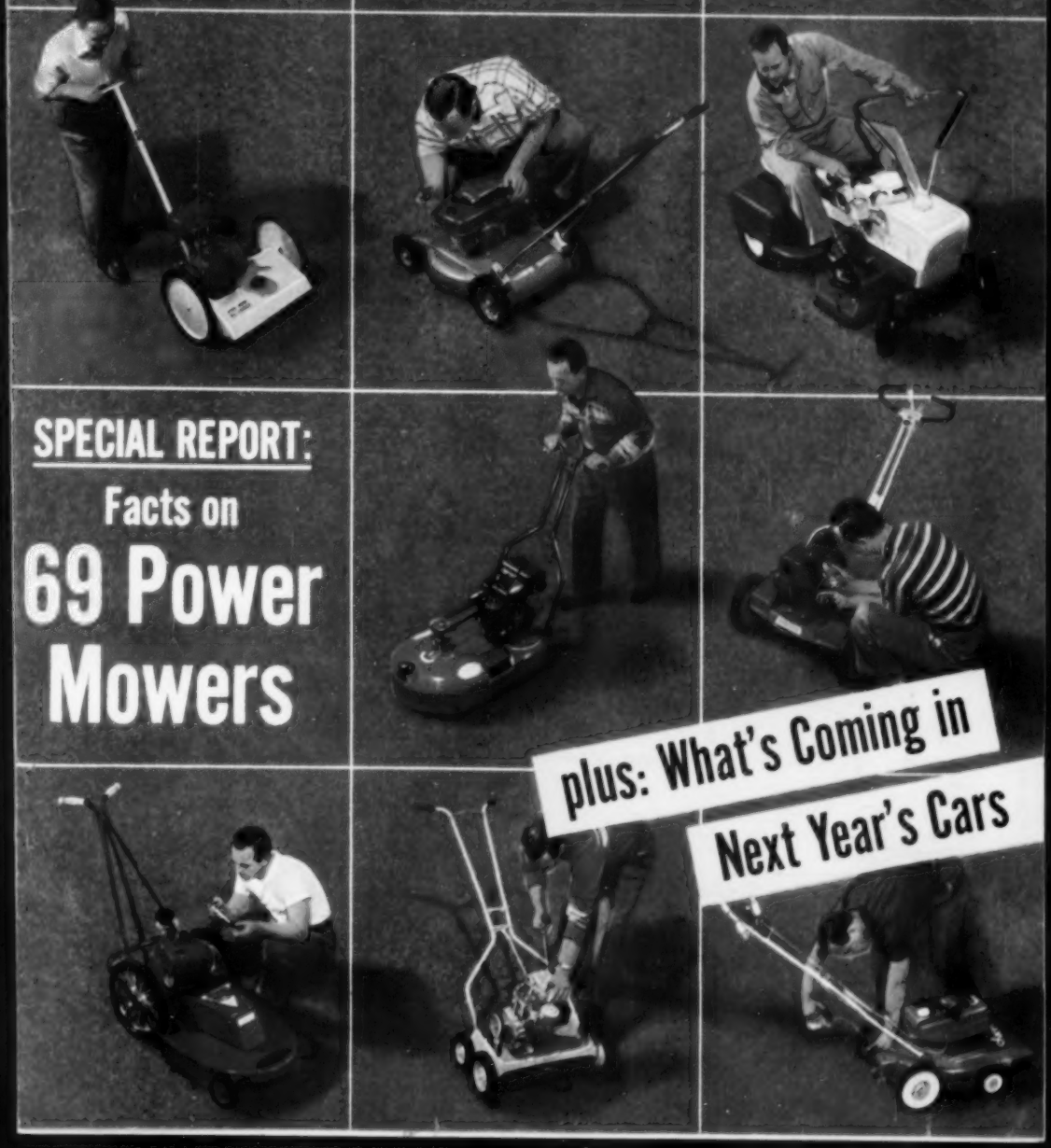
POPULAR SCIENCE

APRIL · 35¢ Monthly



SPECIAL REPORT:

Facts on

69 Power Mowers

plus: What's Coming in Next Year's Cars

How much of this Formica Kitchen remodeling could you do?

Homecraftsmen come in assorted flavors . . . from the weekend bird house mechanic to skilled cabinet makers. Colorful easy-to-work Formica suits the abilities of anybody who can saw a straight line. If you have more enthusiasm than skill you can do simple Formica jobs like resurfacing your present rotted out sink or apply Formica to walls. Even if you tackle tougher jobs like these Formica faced cabinets, you'll find that Formica surfacing is the easiest part of the job . . . and the most fun.

Maybe you'll want fully formed tops you can order from your Formica fabricator and install yourself. Why not learn more about Formica now?

FREE We have two kits of helpful literature on the use of Formica. Just check the coupon for the one you want.

FORMICA CORPORATION

Subsidiary of CYANAMID

4726-7 Spring Grove Avenue, Cincinnati 32, Ohio

In Canada: Arnold Banfield & Co., Ltd., Oakville, Ontario

☐ Don't confuse me with too much stuff. Just tell me the easy way to do simple jobs.

☐ You can't scare me! I have power tools and know how to use them. Shoot the works.

Name .....

Address .....

City ..... *Zone* .... *State* .....

How we retired in 15 years with $300 a month

We're having a wonderful time, Betty and I. We're doing all the things we've always dreamed of doing. We enjoy our home. Summers, we pack the car and take trips. And it's all thanks to a check for $300 that comes by mail, as regular as clockwork, every month!

Luckily for me, I was only forty when Betty began to worry about our future. "You're going to want to slow up in a few years," she'd say. And I'd laugh. Because I felt fine. "But you won't always want to work," she'd say. "Well, I still have fifteen good earning years ahead of me," I'd answer.

But one day she stopped me. She asked me how much I'd earn in the next fifteen years—not counting raises. I did some quick arithmetic, multiplying my salary by fifteen. It ran up into *six figures!* I grinned.

Betty wasn't impressed. "How much of that do you think we'll save?" she asked. I had to be honest. We were always paying off on a new car or a radio, or going places. "A thousand or two," I admitted.

"That's just our trouble," she said. "We can't seem to save. You ought to take out one of those retirement income plans right now."

So I looked into the subject and discovered the Phoenix Mutual Retirement Income Plan. It was a way I could make part of my salary *now* buy me a retirement income *later*. All I needed was to start in time. With a Phoenix Mutual Plan, I could get a check for $300 a month for life, starting in fifteen years, when I reached fifty-five. I applied immediately and qualified.

The big day came fifteen years later, when our first Phoenix Mutual monthly check for $300 arrived in the mail. *I retired.* Now Betty and I are having the time of our lives—with no money worries.

Send for Free Booklet

This story is typical. Assuming you qualify at a young enough age, you can plan to have an income of $100 to $300 a month or more—starting at age 55, 60, 65 or older. Send the coupon and receive, by mail and without charge, a booklet which tells about Phoenix Mutual Plans. Similar plans are available for women. Don't delay. Send for your copy now.

ESTABLISHED 1851

PHOENIX MUTUAL

Retirement Income Plan

GUARANTEES YOUR FUTURE

OVER 100 YEARS OF LIFE INSURANCE PROTECTION FOR BUSINESS AND FAMILIES

COPYRIGHT 1957, BY PHOENIX MUTUAL LIFE INSURANCE COMPANY

PHOENIX MUTUAL LIFE INSURANCE CO.
214 Elm Street, Hartford 15, Conn.

Please send me, without obligation, your free 28-page book showing new retirement income plans.

☐ *Plan for Men* ☐ *Plan for Women*

Name_____

Date of Birth_____

Business Address_____

Home Address_____

Founded in 1872 · Vol. 170: No. 4 *Mechanics and Handicraft* REG. U. S. PAT. OFF.

Popular Science Monthly

April, 1957

The hard facts about all the leading power mowers—to make it easy for you to choose the one best suited to your needs. . . . ALSO, the latest news on outboards: what to look for, who's got it, and what it costs

AUTOMOBILE NEWS

Getting the Most from Your 1957 Car · 83
What's Coming in 1958 Cars · 87
Superchargers Spur Horsepower Race · 108
Why Your Car's Engine Grows Old · 172

WORLD OF SCIENCE AND INDUSTRY

Atomic Battery Lasts for Years · 97
How You Fly the One-Man Copter · 112
Taming the World's Meanest Rock · 118
Engines to Launch the Satellite · 124

PS REPORTS TO BUYERS

Facts and Figures on New Power Mowers · 98
Hop Aboard and Mow Your Lawn · 104
New Outboards: High Power, High Style · 134

PICTURE NEWS

Smoke Goes Through Sheet of Metal · 139
Stilts Land Snark Intact · 140
Plush Outboard Fishes Electronically · 142
Float-In Movie Bows In on Swiss River · 143
Digger Claws 34,000 Tons a Day · 148
Fold-Out Sidecar Opens Up into Tent · 148
Reactor Swings Up in "Airborne" Test · 152
Missile Scores Direct Hit in Field · 153
Bubble Pipe Keeps Channel Ice-Free · 154

Managing Editor
HOWARD ALLAWAY

Associate Managing Editor
Frank Rowsome Jr.

Assistant Managing Editors
Kendall W. Goodwyn
Wesley S. Griswold
Robert P. Stevenson

Senior Editors
Devon Francis
Martin Mann
Everett H. Ortner
Harry Walton

Associate Editors
Alden P. Armagnac
Henry B. Comstock
Frank Dorr
Sheldon M. Gallager
William Gilman
Herbert O. Johansen
Herbert R. Pfister
Marvann Smith
Ruth Westphal

Editorial Assistants
Rosa Lee Beeland (Chief)
Annette Krauss (Research)
Anna Dallas, Bebe Lipson,
Roberta Marks, Georgette Sparks

Art Director
HOWARD C. JENSEN

Art Editors
Herbert Anthony
Harry Samuels

Art Associates
Robert W. Blinn
Eric A. Karminski Jr.
Henry W. Kazmirowski
Adolph J. Le Moult
Dana B. Rasmussen

Photography
W. W. Morris (Chief)
Hubert Luckett
Orlando Guerra

America's Leading New-Idea Magazine for 85 Years

SPECIAL FEATURES

U.S. Jets Keep Watch on the Rhine · 89
Can Your Youngster Get Into College? · 92
Your House Is Your Savings Account · 106
Vacuum Cleaner Now Drills Holes · 110
60 Days and Nights in an Inferno · 128
How They Make Fish Hooks · 132
Gus Beats the Gun · 160
63 Tests to Rate Your Next House · 199

FOR HOME AND SHOP

Buying Bolts by the Yard · 166
Washing a House Saves Painting · 176
Complete Tear-Out Booklet:
"Before You Buy Wood" · 178
How to Build a Speaker Enclosure · 195
PS Fix-It File: Lamp Cords · 197
How to Repair an Umbrella · 206
The Building Board That Won't Burn · 211

What does a two-by-four really measure? What woods are best for furniture? For shelves? What's the difference between interior and exterior plywood? Here are the facts, in handy booklet form, that help you get the right wood for your job—and save money, too

WHAT'S NEW IN . . .

Keeping the Home Shipshape · 10
Ideas from the Inventors · 155
Aids to Modern Living · 158
Hints from the Model Garage · 164
Car Accessories · 175
Tools for Your Shop · 215
Handyman Products · 216

EVERY MONTH . . .

PS Readers Talk Back · 4
Prize Projects by PS Readers · 12
I'd Like to See Them Make · 14
You Ought to Know · 17
Wordless Workshop · 170
PS Shop Notebook · 204
Short Cuts and Tips · 217

Publisher
RALPH H. FLYNN

Advertising Manager
LEE P. ADAMS

Circulation Director
EUGENE WATSON

EDITORIAL OFFICES:
353 Fourth Ave., New York 10, N.Y.

ADVERTISING OFFICES:
NEW YORK—353 Fourth Ave.
CHICAGO—360 North Michigan Ave.
DETROIT—820 Book Bldg.
SAN FRANCISCO—114 Sansome St.
CLEVELAND—636 B. F. Keith Bldg.
LOS ANGELES—1127 Wilshire Blvd.
PORTLAND, ORE.—520 S.W. Sixth Ave.

Published monthly at 353 Fourth Avenue, New York 10, N. Y., by Popular Science Publishing Co., Inc., Godfrey Hammond, Chairman of the Board; Ralph H. Flynn, President and Treasurer; Franklin E. Parker Jr., Secretary; Eugene Watson, Vice-President. Second-class mail privileges authorized at New York, N. Y., and Dayton, Ohio. Entered as second-class matter at the Post Office Department, Canada. Printed in U.S.A.

Copyright, 1957, by Popular Science Publishing Co., Inc. All rights reserved in the United States, Great Britain, and in all the countries participating in the International Copyright Convention and Pan-American Copyright Convention.
Single copy 35¢. Subscriptions to United States, its possessions, and Canada, 1 year $3.40 (2 years $6.00, 3 years $8.00). Elsewhere, 1 year $6.00 (2 years $11.00, 3 years $16.00). Four weeks' notice is needed to change a subscriber's address. Please give both old and new addresses, including postal zone numbers.

PS Readers

TALK BACK

Hi-Fi Scores a Hit

MAY I add my name to your already large list of happily informed hi-fi enthusiasts who agree that the articles published in PS in the past several months . . . have simplified the technical aspects of audio systems.

KEN VOGT, Milwaukee

. . . With the help of the hi-fi articles in

PS, I have chosen a set and hope to enjoy "real music" for a good many years.

G. W. TAPPAY, Vancouver, B. C.

. . . I have been looking for something like the Hi-Fi Test Record described in your January issue ["This Record Checks Out Your Hi-Fi System"] for a long time.

W. C. PIERCE, New Canaan, Conn.

. . . I am ordering your Hi-Fi Test Record even though I realize it may show some unsuspected defects in the homemade rig of which I am so proud.

You are to be commended for the current series on hi-fi components. Very few small towns have any hi-fi displays or stock, and much of this equipment must be bought by mail on a sight-unseen, buyer-beware basis.

L. W. HALSEY, Battle Creek, Mich.

. . . Congratulations on your hi-fi articles. They are the best I have seen, including those in electronics magazines.

CHARLES THAMES, Jackson, Miss.

. . . All of us here at the University of Illinois have been reading the hi-fi articles in the last few issues of POPULAR SCIENCE. We would like to thank you for instructions on what to look for in hi-fi equipment. Most of us enjoy good music, but the cost of schooling absorbs most of our funds. Those of us who could afford to buy components used your articles as a guide in purchasing the best equipment our money would buy.

Please hurry the test record along before we make costly mistakes in selecting equipment. All 20 of us will be waiting anxiously for the record.

MICHAEL R. SOMIN, Chicago

. . . I especially liked your series on high-fidelity equipment since it is so seldom that such information and specifications are listed together for comparison.

ALVIN L. CHENEY, Donora, Pa.

. . . Thanks for your test record and article ["I Tuned My Speaker with a Test Record," Mar.]. I thought my system was fine—but after checking with your record I found the port needed work.

ROBERT S. THOMSEN, Norwood Park, Ill.

. . . Enclosed is my check for $52 for 26 of your test records. I showed the article to a couple of hi-fi enthusiasts in the electronics lab where I work, and in no time at all, about two dozen engineers and technicians had asked me to order for them, too.

By ordering all at once we thought you might give us an even better discount than you offered in your article. (Even if you don't it's still a good price!)

EDWARD D. LOOMIS, Lawndale, Calif.

Rather than down, the price of the Hi-Fi Test Record must go up as of April 1.

We developed the record as an editorial service and offered it to readers at a no-profit price of $2.50. But we didn't expect to get orders for 20,000 records in six weeks!

Because we are not in the record business and are not prepared to produce and sell records, and because our readers have had an opportunity to buy at cost, we are turning the business over to a specialist.

If your dealer cannot supply the Popular Science Hi-Fi Test Record, you can buy it by sending check, cash or money order to Records, 104 E. 26th St., New York 10, N. Y. The price is $3.50 for one record, $5 for two.

We Spread International Good Will

ABOUT two years ago I hurled a brickbat

Cast your ballot for a successful future!

256 I.C.S. COURSES

Whether you stand at a machine or sit at a desk . . . whether you're making $75 a week or $75 hundred a year . . . whether your interest is Power Plants or Paper Pulp, Advertising or Electronics . . . chances are I.C.S. has exactly the course you need to get ahead.

I.C.S. is not only the oldest and largest correspondence school. It also offers the most courses. 256 in all. Each one success-proved by graduates who rose to top technical and administrative positions. Chief engineers. Superintendents. Foremen. Managers. Executive assistants.

I.C.S. Courses cover bedrock facts and theory plus practical, on-the-job applications. No skimping. Texts are prepared by leading business and industrial authorities working with I.C.S. editors and educators. They are constantly being reviewed and revised in line with current developments.

As an I.C.S. student, you study in your spare time, set your own pace. No time lost getting to class or waiting for slower students to catch up. If you wish, I.C.S. will make progress reports to your employer. You win recognition as a "comer," one who is ready to move ahead. Thousands of students report pay increases and promotions within a few months of enrollment. All graduates win the coveted, approved I.C.S. diploma.

3 FREE BOOKS! Check the subject that interests you in the coupon below. I. C. S. will rush you (1) a special book outlining your opportunities in this field, (2) the 32-page gold mine of career tips, "How to Succeed," (3) a sample I. C. S. lesson (Math.) demonstrating the famous "I. C. S. Method." "X" MARKS OPPORTUNITY.

For Real Job Security—Get an I. C. S. Diploma! **I. C. S., Scranton 9, Penna.** Member, National Home Study Council

INTERNATIONAL CORRESPONDENCE SCHOOLS

ICS

BOX 23968R, SCRANTON 9, PENNA. (Partial list of 257 courses)

Without cost or obligation, send me "HOW to SUCCEED" and the opportunity booklet about the field BEFORE which I have marked X (plus sample lesson):

ARCHITECTURE and BUILDING CONSTRUCTION
- ☐ Air Conditioning—Refrig.
- ☐ Architecture
- ☐ Architectural Interiors
- ☐ Building Contractor
- ☐ Building Estimator
- ☐ Building Maintenance
- ☐ Carpentry and Mill Work
- ☐ Heating
- ☐ Painting Contractor
- ☐ Plumbing
- ☐ Reading Arch. Blueprints

ART
- ☐ Cartooning
- ☐ Commercial Art
- ☐ Fashion Illustrating
- ☐ Magazine Illustrating
- ☐ Show Card and Sign Lettering
- ☐ Sketching and Painting

AUTOMOTIVE
- ☐ Auto Body Rebuilding
- ☐ Auto Elec. Technician
- ☐ Auto-Engine Tune Up
- ☐ Automobile Mechanic

AVIATION
- ☐ Aeronautical Engineering Jr.
- ☐ Aircraft & Engine Mechanic

BUSINESS
- ☐ Advertising
- ☐ Bookkeeping and Accounting
- ☐ Business Administration
- ☐ Business Correspondence
- ☐ Public Accounting
- ☐ Creative Salesmanship
- ☐ Federal Tax
- ☐ Letter-writing Improvement
- ☐ Office Management
- ☐ Professional Secretary
- ☐ Retail Business Management
- ☐ Sales Management
- ☐ Stenographic-Secretarial
- ☐ Traffic Management

CHEMISTRY
- ☐ Analytical Chemistry
- ☐ Chemical Engineering
- ☐ Chem. Lab. Technician
- ☐ General Chemistry
- ☐ Natural Gas Prod. & Trans.
- ☐ Petroleum Engineering
- ☐ Plastics
- ☐ Pulp and Paper Making

CIVIL, STRUCTURAL ENGINEERING
- ☐ Civil Engineering
- ☐ Construction Engineering
- ☐ Highway Engineering
- ☐ Reading Struct. Blueprints
- ☐ Sanitary Engineering
- ☐ Structural Engineering
- ☐ Surveying and Mapping

DRAFTING
- ☐ Aircraft Drafting
- ☐ Architectural Drafting
- ☐ Electrical Drafting
- ☐ Mechanical Drafting
- ☐ Mine Surveying and Mapping
- ☐ Plumbing Drawing and Estimating
- ☐ Structural Drafting

ELECTRICAL
- ☐ Electrical Engineering
- ☐ Electrical Maintenance
- ☐ Electrician ☐ Contracting
- ☐ Lineman

HIGH SCHOOL
- ☐ Commercial ☐ Good English
- ☐ High School Subjects
- ☐ Mathematics

LEADERSHIP
- ☐ Foremanship
- ☐ Industrial Supervision
- ☐ Leadership and Organization
- ☐ Personnel-Labor Relations

MECHANICAL AND SHOP
- ☐ Gas—Electric Welding
- ☐ Heat Treatment ☐ Metallurgy
- ☐ Industrial Engineering
- ☐ Industrial Instrumentation
- ☐ Industrial Supervision
- ☐ Internal Combustion Engines
- ☐ Machine Design-Drafting
- ☐ Machine Shop Inspection
- ☐ Machine Shop Practice
- ☐ Mechanical Engineering
- ☐ Quality Control
- ☐ Reading Shop Blueprints
- ☐ Refrigeration
- ☐ Sheet Metal Worker
- ☐ Tool Design ☐ Toolmaking

RADIO, TELEVISION
- ☐ Industrial Electronics
- ☐ Practical Radio TV Eng'r'ng
- ☐ Radio and TV Servicing
- ☐ Radio Operating
- ☐ Television Technician

RAILROAD
- ☐ Air Brake Equipment
- ☐ Car Inspector
- ☐ Diesel Engineer & Fireman
- ☐ Section Foreman

STEAM AND DIESEL POWER
- ☐ Combustion Engineering
- ☐ Diesel—Elec. ☐ Diesel Eng's
- ☐ Electric Light and Power
- ☐ Stationary Fireman
- ☐ Stationary Steam Engineering

TEXTILE
- ☐ Carding and Spinning
- ☐ Cotton, Rayon, Woolen Mfg.
- ☐ Finishing and Dyeing
- ☐ Loom Fixr'g ☐ Textile Des'ing
- ☐ Textile Eng'r'g ☐ Throwing
- ☐ Warping and Weaving

MISCELLANEOUS
- ☐ Domestic Refrigeration
- ☐ Marine Engineering
- ☐ Ocean Navigation
- ☐ Professional Engineering
- ☐ Short Story Writing
- ☐ Telephony

Name _____ Age _____ Home Address _____

City _____ Zone _____ State _____ Working Hours _____ A.M. to P.M. _____

Occupation _____

Canadian residents send coupon to International Correspondence Schools, Canadian, Ltd., Montreal, Canada. . . . Special tuition rates to members of the U. S. Armed Forces.

Do Your Work Easily with PROTO's New, Improved Flat Wrenches

CHECK THESE FEATURES!
Balance . . . Proportion . . . Design • PROTOLLOY Steels • Good Obstruction Clearance • Tough, Non-Slip Finish • Plainly Marked Openings.

PROTO Flat Wrenches are truly "professional quality" tools, made of specially forged alloy steel, carefully heat treated. Designs are based on scientific study to make them as slim as possible for convenience in tight places, yet reinforced properly where it counts to eliminate breakage. See your nearby PROTO dealer today. Send 10¢ for catalog of entire line to

PROTO TOOLS
2217 Santa Fe Ave., Los Angeles 54, Calif.
Eastern Factory, Jamestown, N.Y. • Canadian Factory, London, Ont.

A. NEW! Whitworth Combination Box & Open End Wrenches. Four sizes commonly used on foreign automobiles and motorcycles. Whitworth openings, 3/16" to 3/8". Lengths, 5¼" to 8¼". Satin chrome plated.

B. NEW! Long 6-Point Box & Open End Wrenches. Provide greater gripping area for heavier torque loads. 3/16" to 9/16" openings. 5¾" to 9⅛" lengths. Satin chrome plated.

C. NEW! Ratcheting 12-point Box Wrench. For oil filter work on new cars. 5/8" x ¾" openings. 8 1/16" long. PROTO line now includes 6 tools in this series.

D. NEW! Double Head 12-Point 15° Box Wrench. Meets Mil. Spec. Designed for use on elastic stop nuts. Openings, 7/16" x 17/32". Length, 5¼". Satin chrome plated.

PROTO TOOLS
PROTO means PROfessional TOols

A8888

at your magazine for taking credit for certain features on American motorcycles when, in reality, they had been current on British machines in my youth—some 20 years ago.

In all fairness now, this letter is offered as a bouquet. Your January issue, giving as it does, fair and generous publicity to several British advances, is more than welcome.

Actions such as yours can, in my opinion, do more toward creating international harmony than the speeches of dozens of politicians.

NOEL KIRK, Los Angeles

Bomber Delivered PS the Hard Way

A PARTIALLY burned copy of a 13-year-old POPULAR SCIENCE advertisement recently brought a belated inquiry to the Harley-Davidson Motor Co. from Blazon Ernest, a student at the University of Ljubljana in Yugoslavia.

Ernest writes that in 1944, when he was 12 years old, he found a flame-scarred copy

of PS near the wreckage of a U. S. bomber that crashed near his home. Apparently he kept it until he learned enough English to read the contents and answer the Harley-Davidson ad.

JOHN ABOYA, Milwaukee

Strong Words FOR the Safety Car

A BELATED note of appreciation for the article (and preview, I hope) on the Cornell Safety Car [Dec.]. It's about time somebody put some brains into a car—and not splattered on the windshield.

WILLIAM A. CRANE, Oklahoma City

Two Nurses Feel Neglected

THERE was an interesting article on the Santa Fe's new Hi-Level El Capitan in your

Get into a High Pay ACCOUNTING CAREER

LaSalle's famous staff of Accounting authorities are helping thousands prepare for fast promotions and bigger pay. They can do the same for you!

If your heart is set on a larger income and all that it means . . . better home—fine car—larger bank account—more of the good things of life. . . .

If that's your ambition and you are really serious about it, then you owe it to yourself to get the REAL FACTS about LaSalle Accounting, and the many good-pay opportunities that can be YOURS through LaSalle's famous Problem Method plan.

It matters not whether you've had a single day of experience in this field—or whether you have already started but want to climb higher. LaSalle's expert training is designed to take you *from where you are . . . to where you want to be . . .* in higher positions and a lifetime career of security and good income.

WHY YOU CAN'T FAIL TO GAIN

You see on this page a panel of experts who know Accounting from A to Z . . . all the way from Basic Accounting, on up through Accounting Systems, Cost Accounting, Auditing, Income Tax, and training for the C.P.A. certificate. These are only part of our instruction staff. But what is most important to you . . .

. . . These C.P.A.'s and Expert Accountants know how to impart their knowledge to others . . . how to help you prepare quickly yet thoroly for success in this lucrative field.

The proof? What stronger proof could there be than that more than 4,200 Certified Public Accountants (one out of every 13 of the U.S. total) has trained with LaSalle? Or the hundreds of thousands of men and women whom LaSalle has helped qualify rapidly for more money, a brighter future, in a high-pay-lifetime career? These thousands came to us with different backgrounds of experience and varying degrees of ambition. Many have reported raises and promotions after only a few weeks of training. Thousands of them have written to say they are now earning 50% more—even *double* their former incomes—*often in less than a year.* These letters are published in book form for your inspection. They were written by real people, with real income, problems and ambitions—people who might be your next-door neighbor.

Yes, if you are really sincere in wanting to better your position—start your income climbing—enjoy a lifetime career of high standing and high reward—this friendly staff of experts can help you.

OPPORTUNITIES UNLIMITED

The demand for accountants is great—everywhere. All businesses must have trained accountants to cope with ever-growing requirements. It's a profession offering wide opportunity—always—to the man who knows.

You can fit into any business, anywhere in the country—because accounting principles are universal. Think what this means in terms of security and independence!

SEND FOR TWO FREE BOOKS

The interesting and informative book, "Accountancy, The Profession That Pays," gives all the latest facts about the new and growing opportunities in several different fields of profitable employment.

This can be an important day in your life. A coupon like the one below has started hundreds of thousands of men and women toward a bigger job, a larger income. It can do the same for you.

Member, National Home Study Council

Mail the Coupon Today!

FREE BOOK — FREE BOOK

LA SALLE EXTENSION UNIVERSITY

A Correspondence Institution

417 S. Dearborn St., Dept. 483H, Chicago 5, Ill.

Send free books, "Accountancy, The Profession That Pays," also "Success Reports" without obligation.

Name.....*Age*.....

Address.....

City & Zone.....*State*.....

People who appreciate cars insist on Quaker State Super Blend for finest lubrication!

Super-refined from Pure Pennsylvania Grade Crude Oil, world's finest. Famous for performance, protection, economy! Try it!

QUAKER STATE OIL REFINING CORP., OIL CITY, PA.
Member Pennsylvania Grade Crude Oil Association

January issue. We were wondering why the two registered nurses who are also a part of the train weren't mentioned.

TWO SANTA FE COURIER NURSES, Chicago

Santa Fe's two pretty courier nurses were both seen and given hi-level praise by Author Wes Griswold. The editorial surgeon who amputated this vital information is blushing. His own daughter is a registered nurse.

Why Break Such a Happy Habit?

FIVE years ago I broke the PS habit and began to make money instead of spending most of my spare time fooling with the fascinating gadgetry suggested in your pages.

However, I did pick up your January issue

to see what you had to say about the B-52. Now I'm involved in four projects and my spare time is gone.

ART BONNEY, Hyde Park, N. Y.

Watch Those Speed Runs

DALE R. NELSON, proud of his '56 Windsor, seems to be stirring up a little competition ["Readers Talk Back," Jan.]. I feel that letters like this may encourage test runs on the highways and not on measured courses.

For the safety of our highways, I feel that uncontrolled contests of this kind should be discouraged.

M. V. OAKES, Grand Junction, Colo.

We agree 100 percent. Mr. Nelson pointed out, however, that his speed run was made "on a blocked-off speed strip."

"Worst" Car Drivers Make the News

AS PRESIDENT of the Rockland High School Safe Driving Club, I can say that the majority of teen-age drivers are most interested in proving that we are not all pirates and ogres behind the wheel ["Who Are America's Worst Drivers?" Jan.].

We younger drivers may have a slightly larger number of accidents per capita as compared with adults, but in newspaper space, we have the adults whipped by a

[Please turn to page 20]

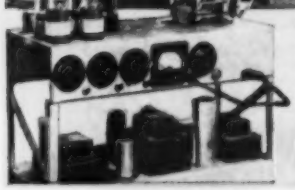
Be a Radio-TV Technician
Learn at Home in Spare Time

America's Fast Growing Industry Offers You
GOOD PAY—SECURITY—A BRIGHT FUTURE

Training PLUS OPPORTUNITY is the ideal combination for success. Today's opportunity field is Radio-Television. Plan now to get into Radio-TV. Radio is bigger than ever. TV is growing. Color TV, Hi-Fi promise added opportunity.

Start Soon to Make $10, $15 a Week Extra

Soon after enrolling, many NRI students earn extra cash fixing neighbors' sets. Keep your job. NRI trains you at home in spare time. NRI is oldest and largest home study Radio-TV school. You benefit from our 40 years experience training men.



You Learn-by-Doing

NRI sends you kits of parts to build circuits for practical experience. They "bring to life" things you study. Mail coupon today, **National Radio Institute,** Dept. 7DB, Washington 9, D. C.

SAMPLE LESSON and CATALOG—FREE

NATIONAL RADIO INSTITUTE
Dept. 7DB, Washington 9, D.C.

Please send me FREE Sample Lesson and 64 Page Catalog on Radio-Television Servicing and Communications. No Salesman will call.

Name.....

Address.....

City.....Zone.....State.....

ACCREDITED MEMBER NATIONAL HOME STUDY COUNCIL

Learn to Fix Electric Appliances
Turn Your Spare Time into Cash

Make Extra Money—Start Soon

To build a better future, get into a field where there is important work and opportunity for the trained man. Up to 10 million new electric appliances are sold every year. Every wired home now has an average of 8. Owners pay well to have them fixed properly, quickly. This is your opportunity for a better job, a spare time or full time business. NRI can give you the training you need, at home in your spare time.

Learn and Earn with Tester You Build

Soon after starting you will be able to earn extra cash fixing toasters, clocks, fans, vacuum cleaners for neighbors and friends. Tester you build with parts we furnish helps you locate electrical defects, correct them faster. Keep your job while learning. Turn your spare time into cash.

Train Now for Greater Security
Low Price, Easy Terms

Take the first step now toward higher pay, more interesting work. No need to give up your present job. Train at home. Send coupon for actual lesson to prove NRI home training is practical. Training is low in cost. Convenient monthly payments.

NATIONAL RADIO INSTITUTE
Dept. 7DB, Washington 9, D.C.

Mail today for Lesson and Catalog—BOTH FREE

NATIONAL RADIO INSTITUTE
Dept. 7DB, Washington 9, D.C.

Please send me FREE Sample Lesson and Catalog on your Electric Appliance Servicing Training. No Salesman will call.

Name.....

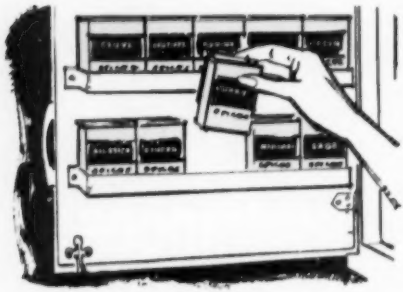
Address.....

City.....Zone.....State.....

ACCREDITED MEMBER NATIONAL HOME STUDY COUNCIL

Keeping the Home Shipshape

METAL WEATHERSTRIPPING needs spring cleaning, too. Tap off loose dust, clean with steel wool and rub with paraffin. Don't paint it or the windows may stick.



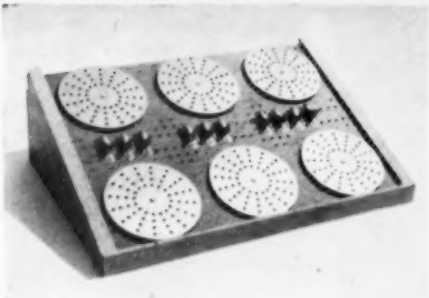
LEFT-OVER COUNTER EDGING can be shaped into a cabinet-door spice rack. Bend the ends of each strip so that cans slide in easily and rest on the lip of the edging.

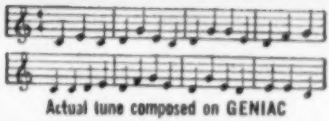
GIANT WIRE CLIPS like this will mark a garden bed. You can make them by bending lengths of coat hanger wire around a broomstick. Press the coil tight with pliers so that it grips the seed packet firmly.

WHEN PUTTYING WINDOWS, first work paint that matches the sash color into your putty. This will eliminate the need for a touch-up job later with its risk of paint-smearing the glass.

TO STORE UMBRELLAS NEATLY yet keep them handy, corral them in a pair of curtain rods fixed to a wall of a closet near the door. Hang a clothespin bag at one end for rubbers.

New! A MACHINE THAT COMPOSES MUSIC





Actual tune composed on GENIAC

COMPUTES, "REASONS" PLAYS GAMES

GENIAC
ELECTRIC BRAIN

BUILD IT YOURSELF in a few hours!

Yes, you build any one of 33 exciting electric brain machines in just a few hours by following the clear-cut, step-by-step directions given in a thrilling booklet! No soldering required . . . no wiring beyond your skill! GENIAC is a genuine brain machine—not a toy. The **only** logic machine kit that not only adds, subtracts, etc., but presents the basic ideas of cybernetics, Boolean algebra, symbolic logic, automation, etc. So simple to construct that even a twelve-year-old can make a machine that will fascinate people with advanced scientific training! With the special circuitry of GENIAC, the Electric Brain Construction kit, you can compose tunes automatically. These new circuits were never available before!

OVER 400 COMPONENTS AND PARTS. Circuits operate on one flashlight battery, and the use of ingeniously designed parts makes building circuits one of the most fascinating things you've ever done! You set up problems in a variety of fields—and get your answers quicker than you can set them up! Play games with the machine—nim, tic-tac-toe, etc.—and pit your brain against its logic! Solves puzzles in a few seconds that would take you hours without the aid of the machine. You actually **see** how computing and problem-solving is analyzed with algebraic solutions transferred directly into circuit diagrams.

YOUR COST FOR GENIAC KIT: only $19.95 postpaid. The 1957 Model GENIAC KIT contains: (1) a complete 200-page text, "Minds and Machines"—a basic introduction to computers. (2) "How to Construct Electrical Brains At Home"—a fully illustrated text book on basic computer design theory and circuits with specific instructions for building circuits. (3) Wiring Diagram Manual. A special booklet with full scale diagrams that you can tear out and place on your work bench for easy assembly. (4) Beginners' Manual. Starting from scratch, the manual adds fifteen extra experiments, thoroughly tested using GENIAC components to teach the basic symbols of electric circuits. (5) Over 400 components and parts.

So—mail the coupon for your GENIAC today! Your money back if not delighted!

Some Firms and Institutions that have ordered GENIAC:

Allis-Chalmers
Remington-Rand
International Business Machines
Wheeldex Mfg. Co.
Manuel Missionary College
Walter V. Clarke Associates
Barnard College
Westinghouse Electric
Phillips Laboratories
General Insurance Co. of America
Lafayette Radio
Rohr Aircraft Co.
Albert Einstein Medical College
Naval Research Laboratories
Los Angeles Public Schools
Kansas State University
Duke University
Coral Gables
Bell Telephone Laboratories

K1—Only

$19.95

(Add $1.00 W. of Miss. $2.00 Outside U. S.)

UP TO DATE?

Is your knowledge of these new technical fields rusty? Perhaps you never had time to study them but need to now. Write for free information about our new, modern, low-cost courses. Work at your own speed at home. Check those that interest you.

PHYSICS
- High School Physics
- ☐ Part 1—P1A
- ☐ Part 2—P1B
- College Physics
- ☐ Part 1—P2A
- ☐ Part 2—P2B

ELECTRONICS
- ☐ Television P3A
- ☐ Radio P3B
- ☐ Radar—Theoretical P3C1
- ☐ Radar—Practical P3C2
- ☐ Musical Instruments P3D

- ☐ Acoustics Hi-Fi P4
- ☐ Nuclear Physics P5
- ☐ Analog Computer C3
- ☐ Digital Computer C2
- ☐ Memory Storage C1
- ☐ Construction of Robots PS7

MATHEMATICS
- ☐ Trigonometry
- ☐ Algebra
- ☐ Solid Geometry
- ☐ Calculus
- ☐ Statistics

CHEMISTRY
- ☐ High School
- ☐ College
- ☐ Analytic
- ☐ Qualitative
- ☐ Quantitive
- ☐ Organic
- ☐ Physical

BIOLOGY
- ☐ High School
- ☐ Human Biology
- ☐ Zoology
- ☐ Botany
- ☐ Genetics

PSYCHOLOGY
- ☐ Normal PS1
- ☐ Child PS2
- ☐ Abnormal PS3
- ☐ Mental Hygiene PS4
- ☐ Aptitude Test PS5
- ☐ Rapid Reading PS6
- ☐ Construction of Robots PS7

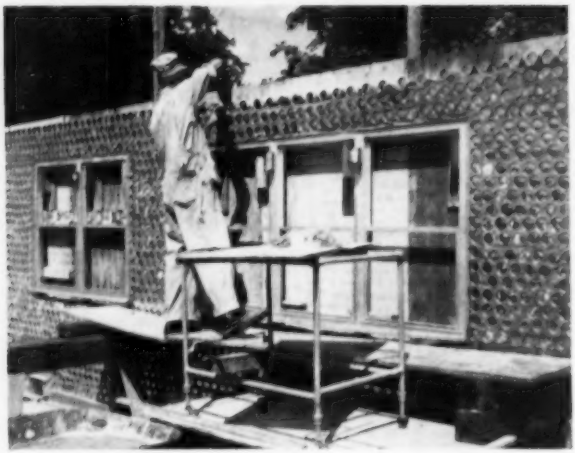
☐ Please send me GENIAC Kit. $19.95 (Add $1.00 West of Mississippi or $2.00 Outside U. S.)

OLIVER GARFIELD CO., Dept. PS47A, 31 Broadway, New Haven, Conn.

Name..... Age..... Occupation.....

City..... Zone..... State.....

Prize Projects BY PS READERS



Tin-Can House. A Quasqueton, Iowa, family will soon take shelter behind 300,000 empty beer cans. H. J. Hasewinkel, a construction foreman, is building his own house with cans he got from a concessionaire at a local fair. By laying up the cans in mortar reinforced with steel bars, he figures he'll get sturdy walls insulated and soundproofed by the dead air sealed in the cans. He plans to cover the exterior of the house with stucco.

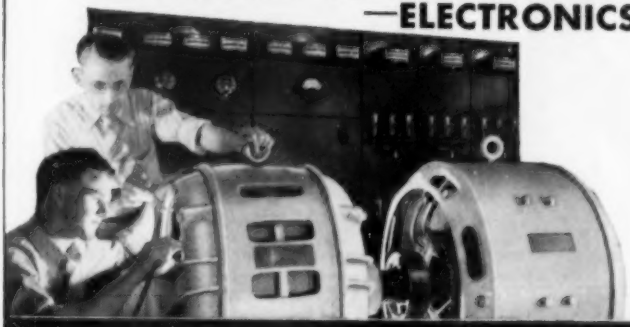
Baby Dozer. A nine-hp. engine runs this garden tractor built by Charles Borte of Silverton, Ore. He put a three-speed transmission and two-speed rear axle in the 1,500-pound vehicle and mounted a 46-inch blade at the front. Individual braking on the rear wheels helps him maneuver in tight spots.

Floating Tea Kettle. Yearning for a steam launch, Gordon Sullivan and Kay Hogan of Seattle learned that a surviving small steamer is hard to find. But they did turn up an old boiler and engine which they mounted on a remodeled hull. Now aboard their 22-foot Quickstep, they whoosh-huff quietly around the noisy boats on Puget Sound.

Have you recently completed a workshop project of which you are particularly proud? Send a good photograph of your work, along with the negative and a brief description, to POPULAR SCIENCE MONTHLY's Mechanics and Handicraft Editor, 353 Fourth Ave., New York 10, N. Y. We will pay $15 for each item that is accepted for publication.

THESE MEN ARE GETTING PRACTICAL TRAINING

IN ELECTRICITY —ELECTRONICS



On Real:

A.C. and D.C. MOTORS
GENERATORS
SWITCHBOARDS
CONTROLLERS
WIRING JOBS
APPLIANCES
ELECTRONIC UNITS

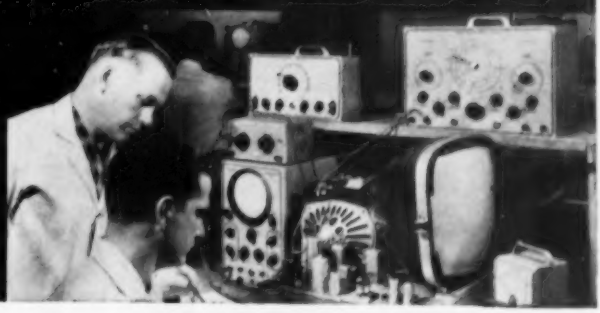
(Shown at left—Instructor explaining operation and testing of a large Motor Generator in our A.C. Department.)

AND TELEVISION-RADIO

On Real:

TELEVISION RECEIVING SETS Including Color TV
AM and FM RADIO RECEIVERS including AUTO RADIOS
TELEVISION TEST EQUIPMENT

(Right — Instructor helping students check the wiring and trace circuits of television receivers.)



Train in the great SHOPS of COYNE

Largest, Oldest, Best Equipped School Of Its Kind In The U. S.

Whether 17 or up to 45 years of age, prepare for your future now. Don't be satisfied with a "No Future" job. Train the Coyne way for a better job *in a field that offers a world of opportunities in the years ahead.*

FINANCE PLAN Enroll now, pay most of tuition later. Part-time employment help for students.

WE TRAIN YOU IN CHICAGO on real equipment. Trained instructors show you how, then you do practical jobs yourself. No previous experience or advanced education needed.

CLIP COUPON NOW for big new illustrated **Coyne** book "Guide to Careers in ELECTRICITY and TELEVISION-RADIO". No obligation; *no salesman will call.* Get vital facts now! ***Training in Refrigeration and Electric Appliances can be Included.***

B. W. COOKE, Pres. **COYNE ELECTRICAL SCHOOL** FOUNDED 1899

A TECHNICAL TRADE INSTITUTE OPERATED NOT FOR PROFIT
500 S. PAULINA STREET, CHICAGO, Dept. 47-73H
ELECTRICITY ★ RADIO ★ TELEVISION ★ REFRIGERATION ★ ELECTRONICS

Mail Coupon for Big Free Book

Training Offered to VETERANS and NON-VETERANS Alike

B. W. COOKE, President
COYNE ELECTRICAL SCHOOL
500 S. Paulina St., Chicago 12, Ill. Dept. 47-73H

Send FREE **book** and details of all the training you offer. This does not obligate me and no salesman will call. I am especially interested in:

☐ ELECTRICITY-ELECTRONICS
☐ TELEVISION-RADIO

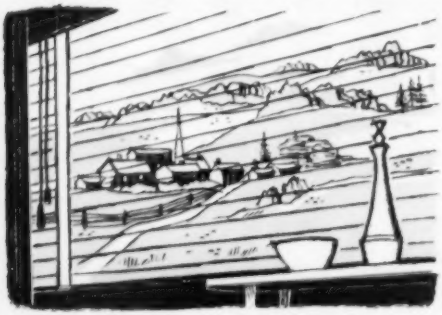
NAME .....

ADDRESS .....

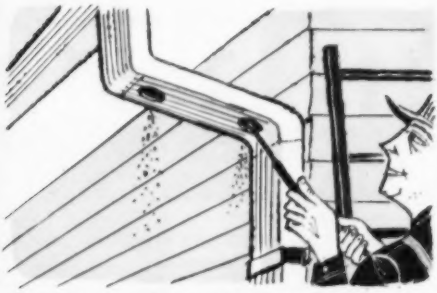
CITY ..... STATE .....

"I'd like to see them make..."

A COMBINATION NAIL AND STAPLE to fasten wire fencing on posts. There'd be less chance of splitting the wood than with two-pronged staples.—*Norman Jupin, New Bedford, Mass.*



SCENIC VENETIAN BLINDS with a landscape painted on the room side of the slats. When the blinds were closed, they would give the effect of a mural.—*R. Hamilton West, Rutherford, N. J.*



CLEANOUTS IN DOWNSPOUTS leading from eaves troughs. Covered access holes every few feet would make it easy to free clogged sections.—*A. R. Tanner Jr., Poughkeepsie, N.Y.*

HINGED REAR-VIEW MIRRORS that you could flip up out of the line of vision, like a sun visor, when you parked the car at a drive-in movie.—*Mrs. Robert C. Guiler, Columbus, Ohio.*

MAGNETIC PAINTBRUSHES that would cling to a paint can when not in use. A magnet set in the handle would hold it snugly to the inner lip of the can.—*B. D. Stewart, Winder, Ga.*

Everyone has his own pet idea of a gadget that he would like to see in general use. The five ideas illustrated above were suggested by POPULAR SCIENCE readers. What is *yours?* We will pay $5 for each one published. Please use Government postcards only. Write name and address clearly. Contributions cannot be acknowledged or returned.

LET DeVRY TECH PREPARE YOU IN SPARE TIME AT HOME AS AN

ELECTRONICS TECHNICIAN

NO PREVIOUS TECHNICAL EXPERIENCE OR ADVANCED EDUCATION NEEDED!

Laborers and bookkeepers, store clerks, shop men, farmers, salesmen — men of nearly every calling — have taken the DeVry Tech program and today have good jobs or service shops of their own in Electronics. You don't have to quit your present job. If you are 17 to 55, see how you may get yourself ready for a future in the fast-growing Electronics field.

Whether you prepare at home or in our well-equipped Chicago or Toronto Laboratories, you get sound, basic training in both principles and practice. At home, you use educational movies. You build actual circuits and test equipment. You read simple directions, follow clear illustrations. When you finish, you are prepared to step into a good job in an excitingly different field. You may even start a service shop of your own. Mail coupon for free facts today.

Live-Wire Employment Service

Puts you in touch with job opportunities—or helps you toward a better position in the plant where you are now employed.

Draft Age?

We have valuable information for every man of draft age; so if you are subject to military service, be sure to check the coupon.

A SAMPLE LESSON FREE

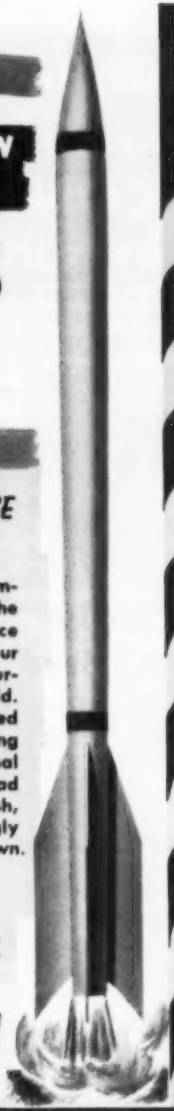
See for yourself how DeVry Tech trains you for real opportunities in Electronics. We'll also give you a free copy of an interesting booklet, "Electronics and YOU."

"One of North America's Foremost Electronics Training Centers"

Accredited Member of National Home Study Council

DeVRY TECHNICAL INSTITUTE
CHICAGO 41, ILLINOIS
FORMERLY
DeFOREST'S TRAINING, INC.

26 YEARS DeVry Technical Institute



AN INDEX to a BETTER JOB, A BRIGHTER FUTURE

- Electronics
- Radar
- Guided Missiles
- Television
- Micro-Waves
- Communications
- Radio
- Industrial Electronics
- Computers
- Automation Electronics
- Remote Control Systems
- Broadcasting
- Your Own Service Shop

MAIL TODAY FOR FREE FACTS

DeVry Technical Institute
4141 Belmont Ave., Chicago 41, Ill., Dept. PS-4-N

Please give me a FREE Sample Lesson and your booklet, "Electronics and YOU."

NAME _____ AGE ____
Please print
STREET _____ APT. ____
CITY _____ ZONE ____ STATE _____

☐ Check here if subject to military training.

#1090 DeVry Tech's Canadian Training Center is located at 626 Roselawn Avenue, Toronto 12, Ontario

My NEW Easy Method Trains You At Home

for a Good-Pay Job and Security IN AIR CONDITIONING AND REFRIGERATION

MAIL COUPON FOR 2 NEW FREE BOOKS

R. C. Anderson, President of Commercial Trades Institute, has devoted his entire adult life to training thousands of men for success in the technical world.

YOUR OPPORTUNITIES FOR SUCCESS ARE BEST IN AMERICA'S FAST-GROWING INDUSTRY

Over 150 million air conditioning and refrigeration units are in use today—and millions more are in production. *The industry is growing so fast that there's a big shortage of trained mechanics who can make installations and repairs.* Air conditioning and refrigeration men are well paid, they work steady, and their futures are secure. *You can break into this big, uncrowded field.* You can do it by learning air conditioning and refrigeration *at home in spare time.* To find out how easy it is, just mail coupon below. I'll send you two books which give astounding job and training facts.

You Get Shop Practice with 23 Big Kits I Send

Only CTI sends you 23 big kits of air conditioning and refrigeration equipment. You get practical service and repair experience at home, the kind of experience that trains and qualifies you for the big-paying field jobs. In the photo above, you see a student assembling a condensing unit with kits I send. The final result is a complete, heavy duty, commercial type, ¼ hp air conditioning and refrigeration high side. CTI kits help you run many tests. You will overhaul, repair and assemble motor and twin-cylinder compressor. With this unit you do 10 complete service and trouble-shooting jobs. During your training, you build and keep an air conditioner, refrigerator, freezer or milk cooler. *Here is a proven, exciting way to get solid experience with your training.* You start at the top, not near the bottom, when you graduate. *Mail coupon below for full description of kits.*

Earn Money Spare Time As You Train

My training will help you begin earning extra money in spare time soon after you enroll. Many students earn from $10 to $20 a week repairing refrigerators and air conditioners in their communities. Many have gone right into business upon graduating because of the satisfied customers they gained while doing spare time work. The "On-the-Job" Training that you get with CTI kits gives you practical experience which makes it easy for you to do outside service work.

Mail Coupon for Facts on Your Future

Make up your mind right now to get the better things out of life. Mail coupon below, which will bring you my brand new book, "Success in Air Conditioning and Refrigeration," and also, a free sample lesson. Learn how I train you . . . how big your opportunities are . . . and what my graduates are earning. — R. C. Anderson, President, Commercial Trades Institute, Chicago 26, Ill.

CTI Trains You for Hundreds of Jobs in this Big-Pay Field . . .

I TRAIN MEN TO MAKE GOOD IN LIFE

"When I came home from the army, there was no work. Thanks to CTI training, I am now employed full time at good wages. I got 3 raises and a bonus. Have my own home."—Daniel Stevens, Springfield, O.

"Without the practical and theoretical training I received through CTI, I never could have started a business of my own. I have a small shop. Am financially independent."—K. Sellman, Guthrie Center, Ia.

"Am very glad I learned through CTI. I am now an able refrigeration technician. Am earning good wages, find my work interesting. I recommend CTI to any ambitious man."—A. W. Heindrich, Kewanee, Ill.

"I find the lessons very interesting and easy. Since my fifth lesson I have been working on refrigerators. I rebuild old ones and sell at a nice profit. Am planning a full time shop."—W. O. Ward, Mich.

"Your course proved to be very valuable to me. As a result of your training, my partner and I run our own repair shop. He is also a CTI graduate. We also employ a former CTI student as our outside repair technician."—J. J. Giertuga, Chicago.

"My training thru CTI has changed my life. It has changed it from working for bare necessities to my owning a business."—J. J. Kish, E. Chicago, Ind.

Last year, 2 million air conditioners were installed in homes. Experts say that 6 million will be sold in 3 years more. Plenty of job opportunities in the home field! And many new jobs are opening in the institutional, industrial and transportation fields, too! Office buildings, factories, hospitals, motels and stores are installing units by the thousands. Experts say that 4 million cars will have air conditioning within three years. You can see, *there's opportunity for high pay and advancement everywhere,* often right in your own back yard. Let CTI help you get set for success.

REFRIGERATION MAKES JOBS

Over 42 million refrigerators in American homes! Over 3 million sold last year—4 million per year in the future! Over 1 million food freezers are sold annually, too. *All this adds up to job opportunities.* When you consider the millions of groceries, meat markets, truck lines, transport systems and beverage industries that depend heavily on refrigeration, you get some idea of the big need for skilled technicians who must install, repair and service. Yes, refrigeration is big, *uncrowded!*

IT'S EASY TO START IN BUSINESS—BE YOUR OWN BOSS

Want to be independent? You, too, can start your own business with a small investment—and grow big, as so many CTI men have done.

MAIL TODAY

Your success is as near as the corner mail box

BOTH BOOKS FREE!

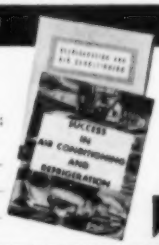
Commercial Trades Institute
1400 Greenleaf Ave.
Chicago 26, Ill. Dept. R-352

Mail me Sample Lesson and 32-page book, "Success in Air Conditioning and Refrigeration." Both FREE.

Name_____ Age_____

Address_____

City_____ Zone____ State_____



You ought to know...

Your house saves you money this month—on your income tax. Three out of four Popular Science readers own their own homes. They can include as tax deductions some house expenses that people who live in rented quarters cannot. Be sure you deduct every cent you're entitled to (the Revenue men want you to). Here are the important expenses to check:

1. Real-estate and school taxes are deductible if they were imposed on you and you paid them (even if you borrowed the money to do so). But assessments for improvements in your neighborhood, such as sewers or curbing, are not deductible.

2. Interest on your mortgage is another big item. Don't deduct the total of your monthly payments to the bank, though. These payments ordinarily include something for amortization to pay off the principal. That part of your payments is not deductible. Find out just how much you paid for interest alone.

3. Casualty losses—disaster-caused damages to your house or possessions—are deductible if they were not covered by insurance.

It's not so easy to prove casualty losses—and you will need proof. Check the local newspaper, which usually reports fires, storms and floods. Your police and fire departments also keep records of such happenings. But you still have to prove that your own property was affected. If the newspaper mentioned you or your neighborhood, you're in luck. Before-and-after snapshots of your property help.

Income-Tax Check List for Homeowners

Ice storm? Fire? Damage from these and many other causes may be deducted from your income tax. A quick look over the list below may save you money.

Cause	Property Damaged
FIRE	CAR
WINDSTORM	HOUSE
HEAVY RAINS	CLOTHING
UNUSUAL DROUGHT	FURNITURE
TERMITES	TREES
SUDDEN COLD SPELL	PLANTS AND SHRUBS
SLEET	

How much can you claim? The Government allows you the difference between the market value of your entire property before the damage and its value afterwards—provided that is no more than the original cost of whatever was damaged. "Market value" means just that: not what you think your property is worth, but what an expert appraiser (real-estate man, architect or engineer) says—in writing—it can be sold for. Bills (or estimates) for repairs may also be accepted as proof of the amount.

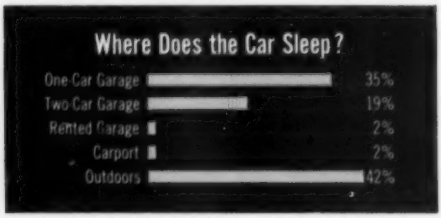
Be sure to claim now any loss during 1956; a later claim is unlikely to be allowed. You don't have to repair or clean up the damage to get your deduction.

A supersonic airliner is in the works in Britain. The British, who pioneered commercial jets, too, have involved seven of their biggest aircraft manufacturers in the research project, which they expect

You ought to know...

to finish in 10 years. If the result is a Mach-1.8 plane (over 1,000 m.p.h.), it could make the London-New York hop in about three hours. Each plane could complete two round trips every 24 hours—a very profitable operation.

Nearly half of all cars stay out in the open all night. The figures shown in the chart below apply to cars belonging to people who own their own homes; among other people, the percentage of outdoor parking is even higher—76 percent for some apartment dwellers. It makes a difference, too, whether the car involved was bought new or second hand; 59 percent of the latter are left out all night . . . It'll be orange juice—650,000 gallons or 13,865,000 glasses—in the hold of a newly converted tank ship plying between Florida and New York. The juice is squeezed (but not frozen) in Florida, packaged in cardboard containers in New York and distributed by milkmen.



Everybody won at the Daytona stock-car races as usual, but the hot-car buffs had some prejudices shaken. The big surprise was Pontiac, which ran wild in its class, taking first and second places in both the flying mile (132 m.p.h.) and the one-mile acceleration run (85 m.p.h.). Among smaller cars it was Chevrolet. Fuel-injection Chevies took the first 33 places in the flying mile, the first 18 places in acceleration . . . There's good reading—amusing and informative—in new books by authors well known to PS readers. Kenneth M. Swezey provides a whole new collection of his delightful home experiments in *Chemistry Magic* ($4.50, McGraw-Hill, New York), and Senior Editor Martin Mann shows, with simple text and striking photos, how the atom helps your everyday life in *Peacetime Uses of Atomic Energy* ($4.50, Thomas Y. Crowell Co., New York).

Look for more tries at transatlantic televiewing. The reason: sunspot activity, which is now near its peak (it varies through an 11-year cycle). The sunspots change the character of electrical layers in the atmosphere, and at peak activity may permit signals in the television range to be picked up across the ocean. Both British and American TV organizations are monitoring each other's telecasts in the hope of being able to rebroadcast them. We stand a better chance of picking up something, because the British TV frequency is lower than ours and should get through more easily. (Don't try to get London on your home set, though; British TV, besides using some frequencies lower than the lowest your set can pick up, operates on a different system.)

Title and contents copyrighted under the general copyright covering this issue.

Try This Automotive Miracle FREE! Now Get Up To

100,000 Miles Without A Single Major Repair!

IT'S TRUE! Now—without spending one single penny— you can start giving the very same car you are driving today up to 7 MORE GAS MILES PER GALLON . . . UP TO 6,000 MILES WITHOUT AN OIL-CHANGE . . . UP TO 100,000 MILES WITHOUT A SINGLE MAJOR REPAIR!

Yes—without buying one single complicated gadget—you can give your present car jackrabbit starts . . . blazing new power for those superhighways . . . smooth dependable power for stop-and-go driving . . . effortless cruising power for those pleasant parkways!

Now, thanks to a modern miracle of automotive science—you can actually drive completely around the world twice—yes, up to 60,000 miles—with one set of sparkplugs . . . drive up to 7 years without needing a ring-and-valve job . . . you can triple the life of your filters—yes, every vital part of your engine—your pistons . . . bearings . . . cylinders . . . can last years longer than you ever dreamed possible—the body of your car many times over—the years ahead of your engine! Yes, without touching one single tool you can actually save up to $200 $300 a year on gas, oil and engine repairs—and get those savings . . . get that thrilling new power and performance—for the full complete lifetime of the very same car you are driving today!

Sound impossible? Well, FACTS . . . THE SCIENTIFIC DOCUMENTED FACTS SPEAK LOUDER THAN ANY WORDS!

The Most Thrilling Driving Results Ever Achieved!

A 1940 Ford V-8 driven by Mr. Wm Johns of Middlesex, N. J. was given every normal engine-wearing, fuel-eating test imaginable! Fender-to-fender driving in thick city traffic . . . roaring along wide open superhighways . . . repeated sudden spurts on the gas pedal . . . starting her up in below-zero weather! **Yet believe it or not, after 169,000 miles of every typical engine-wearing challenge experienced by car-owners — that 1940 Ford is still running like a charm . . . the sparkplugs have given full, hot, firing power 5½ times longer than similar plugs in other cars . . . the pistons, valves, cylinders and rings are still incredibly clean and performing like a charm—its engine has never had a single major repair —and automotive experts are astounded by the fantastic power and life of that engine! More proof?** The Farmers and Consumers milk delivery fleet of Morristown, N. J. attached this fabulous automotive device on 11 of their engine wearing, door-to-door, stop-and-go delivery trucks. Results? The engines on those 11 trucks actually outlasted the ordinary trucks by 5½ times . . . never needed one single major repair!

You'll read many more thrilling case records just like these elsewhere on this page! But right now you're going to discover how YOU can stop spending dollar after dollar on wasted gas, oil . . . on parts that break down—and do it without spending one single penny to prove it!

Why You Waste Dollar After Dollar on Gas, Oil, Repairs!

Do you know what causes the filth on your sparkplugs . . . what causes them to foul and set you up for a $10 bill for new plugs? Do you know what causes the sludge and dirt to form on your pistons—that sets you up for a $15 cleaning job? Do you know what causes the corrosion and holes in your valves—that sets you up for a $20 repair job?

Friends, the deadliest thief under the hood of your car . . . the thief that is robbing your engine of its normal life . . . the thief that is actually lifting dollar after dollar out of your pocket . . . is **POISONOUS ACID!** Yes, deadly engine-destroying **acid!** How does this poisonous engine-wrecking **acid** get into your car? Hold your breath, friends — the answer is . . . **YOU PUT IT THERE — EVERY TIME YOU START UP YOUR CAR!** That's right! It's a **PROVEN SCIENTIFIC FACT** that the gasoline you buy, **any** gasoline, has sulphur in it—forming one of the deadliest metal-eaters known to science! And every time you put your foot on your gas pedal—that gasoline starts manufacturing deadly sulphuric acid right inside your engine! Yes, enough sulphur is in a tankful of gas to completely dissolve a 3-inch nail of solid iron! Yes, and this is exactly what that acid eventually does inside your engine . . . this is exactly how that acid begins to eat away at the metal parts of your engine . . . how it chews away at your valves, pistons and cylinders — and then drops those chewed-up particles of steel and iron into your oil line — where it thickens the filth and grime that chokes and clogs every breathing, moving part of your engine!

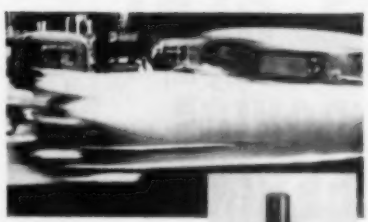
Yes, this dirt and grit seeps through your filter and circulates with your oil! **This is the filth that helps fool your sparkplugs and sets your cylinder walls!** This is the **black, hard grime that coats your pistons, clogs your oil lines, wears grooves into your bearings! Yes, these are the sludges and gums that choke your valves . . . that prevent your engine from breathing and rob it of its real power . . . that gnaw away at the joints and bearings of your engine . . . that set you up for $100 . . . $200 . . . $300 repair bills!**

At Last! Science Gives Your Engine New Pep, Power— Years More Life!

And this was the problem that engineers wrestled with for years before one dedicated man of science stumbled across the answer to this acid problem! Working on an aircraft research project—this scientist discovered that certain **metallic elements** actually have the ability to **DESTROY ACIDS** through **chemical action!** Immediately this scientist knew he had the answer to the most vexing automotive problem of our time! By refining and processing and fusing these acid-killing metallic elements into a special magnesium aluminum core—and then adding a powerful permanent Alnico magnet to the tip of it to pick up the pieces of metal that contaminate your oil — this **remarkable** scientist had invented one of the greatest power-saving, money-saving automotive miracles known to man! Small enough to hide in the palm of your hand—it was simply and quickly attached to the oil drain plug of one car after another—in one test after another—and the results were almost too thrilling to believe! **The Canadian Government tested a similar principle on their own cars—save those test-cars run 17,000 and 20,000 miles without ever needing an oil-change—and that was proof enough! Yes, the Canadian Government actually approved and licensed that amazing new development!**

If you could visit one of the most creative automotive laboratories in America, you could see just how fantastically effective and powerful this scientific acid killer actually is! In front of your very own eyes, engineers would take this tiny miracle of science—drop it into a beaker full of engine-eating acid—acid in a matter of seconds you would see for yourself how that deadly acid begins bubbling and foaming . . . how all the punch and poison is being knocked right out of that acid and being rendered harmless!

Just imagine this simple proof being duplicated inside your car —on every vital part of your engine! **JUST IMAGINE THIS THRILLING NEW ACID KILLER KEEPING YOUR OIL CLEANER AND PURER FOR UP TO 6,000 MILES WITHOUT A CHANGE . . . just imagine it keeping the same set of sparkplugs free of filth for five years . . . your rings and pistons for 7 years . . . yes, just imagine this amazing new ACID KILLER keeping your valves free of choking carbon and grime—letting your engine breathe freely and cheaply with the full throbbing horsepower it's really capable of!** Yes, friends, is it any wonder that this thrilling new scientific development can give your engine up to **100,000 MILES WITHOUT A SINGLE MAJOR REPAIR**—that it can actually start saving you up to $300 a year on gas, oil and costly repairs — with the very same car you are driving today — **without your spending one single penny to prove it!**



YES! This thrilling new automotive miracle actually gives your present car up to 100,000 miles of blazing new power without a single major repair! Up to 7 more gas miles per gallon! Up to 6,000 miles without an oil-change! Impossible? Test it yourself — without spending one single penny! The dramatic documented facts are on this page!

Don't Spend a Penny! Test It Absolutely Free for 30 Full Days!

That's right! You send no money for your MAGNA POWER DRAIN PLUG—all you do is simply try it for one full month — entirely at our risk! What's more, any gas-station attendant will quickly attach MAGNA POWER to your crankcase entirely without charge! Then you drive off and for the next 30 days give MAGNA POWER the toughest tests you can think of! Test it in stop-and-go driving . . . against other cars pulling away at the lights . . . up steep hills . . . on the open highway! If after one full month, you're not absolutely convinced that MAGNA POWER is giving your engine blazing new power . . . jackrabbit starts and split second takeoffs — you simply return MAGNA POWER — you didn't spend a penny for it to begin with! But if 30 days of test driving has absolutely convinced you that MAGNA POWER can add years to every vital part in your engine—that it actually can save you up to $300 a year on gas, oil and costly repairs—then and only then do you simply send us the amazingly low price of $4.98— and MAGNA POWER is yours to keep! You have nothing to risk . . . nothing to lose! And you have year after year of thrilling new power driving to gain! So ACT NOW!

Users Send DOCUMENTED RESULTS!

90,000 MILES AND STILL GOING STRONG!

"I have a Magna Power in my Harbor and also my Plymouth and they are both running still in perfect shape. The Harbor has 90,000 miles on it now and the Plymouth has 65,000. Neither one has had the head off."

C. A. W. Jefferson City, Missouri

"I . . . received two of the Magna-Power Plugs from you and installed them in a 1950 Studebaker Landcruiser which now has 148,000 miles registered and also in a 1953 Stude Champion which we just recently traded in with the speedometer showing 74,000 miles. I must state that from all existing appearances, very favorable results were secured from these units."

R. H. J. Des Moines 9, Iowa

OVER 6,000 MILES ON THE SAME OIL!

"My 1951 Hornet had almost 90,000 hard miles on when the Magna Power plug was installed. It ran over 6,000 miles on the same oil. Ordinarily the oil would have been changed after a few hundred miles."

Bernard H. Hutchins West Palm Beach, Florida

NOW GETS 12 MILES PER GALLON!

"My '47 Ford . . . gets fantastic gas mileage now. 22.5 miles to the gallon, it used to get 15 . . . your speedometer is the only thing I can account for the radical change."

Thad B. Weidman, Gettysburg, Iowa

"Have 1950 Studebaker Champion with 80,000 miles on it. Plugs have never been cleaned, changed or altered—same results—no adjustment. Get 20 miles per gallon. Uses no oil."

T. B. H. Johnson City, Tennessee

"In October of 1953 I purchased a Magna-Power for my 1941 Ford V-8 and want to say this month—it is the best single investment I ever made for an improvement on the engine of any car. My engine is now over five years old and it will get 23 miles per gallon if I drive for mileage."

E. J. M. Oklahoma City, Okla.

75,000 MILES WITH SAME SET OF SPARK PLUGS!

"We have a fleet of four trucks and two scientific cars all equipped with your marvelous acid neutralizer and have had exceptional success with them. One car is a 1950 Hudson Hornet with 75,000 miles on it."

"If you now has 75,000 on one set of spark plugs, I would said . . . ."

H. V. Lassiter Machinery Co. Albuquerque, New Mexico

"The plugs were installed the time I traded the 1951 Plymouth off and they had gone 57,000 miles and were cleaned once on that period. They are still using no oil when I traded it in at approximately 80,000 miles and getting top performance."

E. R. L. Monroe, Wisconsin

LIKE HAVING A NEW CAR!

"I now have 60,000 miles on my '50 Buick. Due to the fact that I have always used the same oil, I want to give credit to this wonderful Magna Power plug you sell. My car seems to have more power and the hydraulic lifters are very quiet. The motor has never been gone into for valve job. Frankly, it is almost like having a new car."

C. F. C. Kansas City, Mo.

IMAGINE! The spark plug on the left was removed from an ordinary car after 5,210 miles. Its firing power is pitted . . . choked with filth . . . barely able to give half the spark it should. But the plug on the right—taken from a MAGNA POWER equipped car—is sparkling clean after 61,810 miles—still able to give full, hot, firing power on every single stroke! Discover how every single part in your engine can last years longer than you ever dreamed possible!

PHOTOGRAPHIC PROOF!

Drive Up to 5 YEARS With ONE Set of Spark Plugs!

YOURS FREE FOR 30 DAYS!

Send No Money! Don't Even Pay the Postman!

MOUNT VERNON RESEARCH LABORATORIES, DEPT. 239
P. O. BOX 732, BALTIMORE 3, MARYLAND

Yes, I want you to send me ABSOLUTELY FREE your thrilling new MAGNA POWER! I understand that I don't even pay the postman one single penny when MAGNA POWER is delivered—that I simply try it on my present car for 30 full days entirely at your risk! If at the end of one full month I am not convinced that it can help give my present car up to 7 MORE GAS MILES PER GALLON . . . UP TO 6,000 MILES WITHOUT AN OIL CHANGE . . . AND UP TO 100,000 MILES WITHOUT A SINGLE MAJOR REPAIR— I simply return the used MAGNA POWER—it didn't cost me a penny to begin with! But if 30 full days of test driving HAS absolutely convinced me that MAGNA POWER CAN add years to every part in my engine . . . can actually save me up to $300 a year on gas, oil and costly repairs . . . can give my present car the blazing new pep, power and performance that I have described possible . . . then and only then do I send you the amazingly low price of $4.98 and MAGNA POWER is mine to keep for year after year of power driving!

MAKE OF CAR _____ YEAR _____

NAME _____ *(Please Print)*

ADDRESS _____

CITY _____ ZONE ____ STATE _____

Please send me two MAGNA POWERS. If satisfied after 30 days, I send only $8.96. (This will be a savings of $1).

MAKE OF 2nd CAR _____ YEAR _____

© Entire Contents Copyrighted 1956 By Mt. Vernon Research Lab.

20 YEARS OLD!

He's already an

ELECTRONICS ENGINEERING DESIGNER

Out of high school just 2 years ago, this young man has already started a fascinating, highly rewarding career in electronics engineering. No matter whether you are now 18 years old—or 28—a 26-month Embry-Riddle education will prepare *you* for a quick start in this lucrative professional field.

Electronics Engineering Design course concentrates on essential technical studies and practical projects. With the aid of top flight Embry-Riddle instructors you'll master many absorbing fundamentals---Microwaves and Radar, Servomechanisms, Industrial Electronics and Television, to mention a few of the subjects.

The demand for trained engineers is greater than the supply—and will be for years! So take the first step now—mail this coupon. And remember, study and play in Miami's perfect year-round climate is stimulating and exciting.

FOUNDED 1926

Training Authorized under G.I. Bills

Embry Riddle *International*

SCHOOL OF AVIATION

MAIL THIS COUPON TODAY

DEAN OF ADMISSIONS, Dept. 91
Embry-Riddle School of Aviation, Miami 30, Florida
Without obligation, please send **FREE** and postpaid full particulars.

☐ ELECTRONICS ENGINEERING DESIGN
☐ AERONAUTICAL ENGINEERING DESIGN

Name..... Age.....

Address.....

City..... State.....

I am a (check one) ☐ Veteran ☐ Non-Veteran

mile. When a teen-ager is involved in an accident, all teen-agers are to blame, and we pay dearly in insurance premiums. When an adult is in an accident, the auto "went out of control."

GEORGE HIGGINS, Rockland, Mass.

Forty-Year Reader Speaks Up

SINCE I started reading POPULAR SCIENCE in the Newton (Mass.) free library almost 40 years ago I have not missed many issues. I think the January issue is the best one yet in subject matter, and most of all in its fresh and inviting visual appearance.

PERRY GITHENS, Westport, Conn.

It's the *Martin* Matador

IN Frank Harvey's story about the TM-61 Matador [Feb.], he did not mention the missile's builder—the Glenn L. Martin Co. of Baltimore. As a former employee of the company I am displeased and insulted, for it is a great credit to its manufacturer.

KENNETH A. ROZETT, Brooklyn, N. Y.

No insult intended. Everyone connected with the Martin Co. has a right to be proud of the Matador. While we are at it: In the article on the B-52 Air Force A-bomber [Jan.], we failed to mention that the Superfortress is manufactured by the Boeing Airplane Co., of Seattle.

Figures Don't Jibe

IN YOUR February issue you give the inside height of the Buick station wagon as 45.4 inches, while the door-opening height is only 27.6. Also you give the Oldsmobile tailgate opening as 35.6 but the inside height as 30.5. I would appreciate the true figures.

DAVID RICE, Sparta, Wis.

Shame on us! The interior height of the Buick is 30.5 inches and the figure for the Olds tailgate should be 27.6.

Here's Mud in Your Ice

IF YOUR car's rear wheels spin on ice or snow, get out and hit the rear fenders with your fist or a stick. You'll be surprised how much dirt falls from under the fenders on the rear tires and the ground to give you traction.

LAWRENCE W. TORELL, Minneapolis

INVENTORS

Learn how to protect your invention. The U. S. Patent Laws provide that any new and useful art, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if the act of invention is involved. Therefore, every inventor with a valuable invention should take advantage of the Patent Laws and proceed for patent protection in order to safeguard his rights.

A patent gives the inventor the exclusive right to prevent others from making, using, or selling the invention claimed in the patent for a period of seventeen years.

The Patent Laws were enacted for the benefit of the inventor to give him protection for the features of his invention which are patentable. These features must be properly and concisely set forth and claimed in a formal application for patent, in order to comply with the requirements of the Patent Laws. For that reason, unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and are prepared to serve you in the handling of your patent matters.

A specially prepared booklet entitled "Patent Guide for the Inventor", containing detailed information with respect to patent protection and procedure, together with a "Record of Invention" form will be promptly forwarded to you without obligation upon request.

CLARENCE A. O'BRIEN & HARVEY JACOBSON

Registered Patent Attorneys

72-D DISTRICT NATIONAL BUILDING
WASHINGTON 5, D. C.

These great minds were Rosicrucians . . .

Francis Bacon *Benjamin Franklin* *Isaac Newton*

WHAT SECRET POWER DID THEY POSSESS?

Why were these men great?

How does anyone—man or woman—achieve greatness? Is it not by mastery of the powers within ourselves?

Know the mysterious world within you! Attune yourself to the wisdom of the ages! Grasp the inner power of your mind! Learn the secrets of a full and peaceful life!

Benjamin Franklin, statesman and inventor . . . Isaac Newton, discoverer of the Law of Gravitation . . . Francis Bacon, philosopher and scientist . . . like many other learned and great men and women . . . were Rosicrucians. The Rosicrucians (NOT a religious organization) have been in existence for centuries. Today, headquarters of the Rosicrucians send over seven million pieces of mail annually to all parts of the world. Address: Scribe Z.J.J.

THIS BOOK FREE

The ROSICRUCIANS

San Jose (AMORC) California, U.S.A.

SEND THIS COUPON

Scribe Z.J.J.
The ROSICRUCIANS
(AMORC)
San Jose, California, U.S.A.

Please send me the *free* book, *The Mastery of Life*, which explains how I may learn to use my faculties and powers of mind.

Name_____

Address_____

City_____

State_____

DIESEL MEN WANTED

Earn $100 per week and up

AUTO-DIESEL MECHANICS

You learn fast in our school and shops because you learn with tools on real equipment. Experienced instructors explain WHY and show you HOW, then you DO IT YOURSELF with tools on various makes and models. One of the best equipped technical schools of its kind in the United States. Thirty-seven years experience training men. Successful graduates in 48 states and many foreign countries. Approved for veterans. Day and evening classes. Earn While You Learn. Write for free bulletin.

NASHVILLE AUTO-DIESEL COLLEGE

226 7th Ave. N., Dept. 42 Nashville, Tenn.

BUY WHOLESALE 100,000 ITEMS

- Toys
- Sewing Equip.
- Gifts
- Books
- Jewelry
- Housewares
- Furniture
- Appliances
- Novelties
- Etc., Etc., Etc!

Buy At 20%, 30%, 50% and More Off On Everything You Buy!

For yourself or for resale! SAVE MONEY! EARN MONEY selling to others. Famous brand merchandise—Thousands of items. Buy singly or in quantity. New 1957 "Buy-It-Wholesale" Directory tells you WHERE & HOW to buy **everything** you need at lowest WHOLESALE PRICES. Just $1 per copy—you may save that much on your 1st buy! FREE! $1 credit voucher with each wholesale directory. Can be applied toward number of items on special merchandise list. HOW CAN YOU LOSE? Rush $1 at once for your copy.

PURINGTONS, 125 Oxford, Lynn 510, Mass.

Ride while you work!

Plow, cultivate, mow, rake, harrow, till, plant, bulldoze, plow snow, spray, saw, maintain beautiful lawns. 8.4 hp. All-gear drive. B-W 4 speed trans., clutch, diff. 770 lbs. Low cost. Ready to run. Quick-change implements. 100% satisfaction guaranteed.

Write for FREE CATALOG

COUNTRY SQUIRE TRACTOR CO.
P.O. Box 107 A-4
MUSKEGO, WISCONSIN

High School at Home

MANY FINISH IN 2 YEARS

No classes. No time wasted going to and from school. Progress as fast as your time and abilities permit. Standard H. S. texts supplied. Thousands enroll each year in this 60-year-old school. Send for FREE descriptive booklet.

AMERICAN SCHOOL, Dept. H446
Drexel at 58th St., Chicago 37, Ill.

Without obligation, please send FREE descriptive booklet.

Name.....

Address.....

Complete Canadian Courses available. Write American School, Dept. H446, 6083 Sherbrooke St. W., Montreal

INVENTORS

If you believe that you have an invention, you should find out how to protect it. The first step is to have a search made of the prior pertinent U. S. patents. If a report on this search indicates that the invention appears patentable you can apply for a patent, and the specifications and claims should be prepared.

The firm of McMorrow, Berman & Davidson, with offices in Washington, D. C., is qualified to take the necessary steps for you. We can make a preliminary search on your invention, advise you whether we think it can be patented, and prepare your application for patent.

Unless you are fully familiar with the U. S. Patent Laws, we recommend that you engage the services of a Registered Patent Attorney to protect your interests. The patent laws are *your* laws. A patent gives you the right to prevent others from making, using or selling the invention claimed in your patent for a period of 17 years.

Use these patent laws for your protection. Investigate whether your invention can be patented. If you have what you believe to be an invention, we suggest that you have this firm make a search for you.

Send for a copy of our Patent Booklet entitled "How To Protect Your Invention," containing information about patent protection and patent procedure. Along with this we will also send you an "Invention Record" form, for your use in writing down and sketching details of your invention. We will mail them promptly. No obligation. They are yours for the asking.

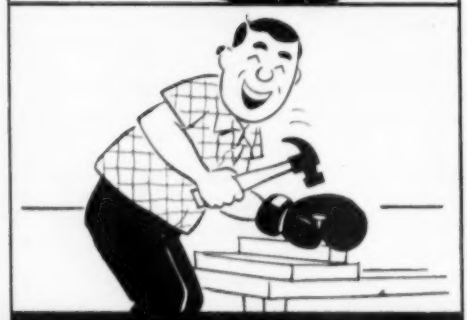
McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

PATENTS · COPYRIGHTS · PATENTS

1427 VICTOR BUILDING, WASHINGTON 1, D. C.

Looking for Something?



FROM HARDWARE TO SPORTING GOODS
whatever you need-

Find It Fast In The Yellow Pages

Ads with this emblem make your shopping easier

---

start a big profit business with a small investment
EARN UP TO $200 a DAY

Manufacturing Exciting New
RAINBOW ROCK
Concrete Slump Brick in your back yard

Earn big building boom profits with Rainbow Rock, the colorful new building brick that's taking the country by storm. Sell all you can make to contractors, builders, building supply houses. **RAINBOW ROCK CUTS LABOR COSTS BY 1/3!** Amazing low cost machine makes modern slump brick 24" long (3 times the length of ordinary brick) in a variety of widths and pastel colors . . . up to 1500 bricks a day! **NEEDS NO SPECIAL SKILL.** Operates indoors or out. Full instructions and valuable mixing formulae supplied. **YOU CAN START EARNING BIG MONEY NOW. PAY AS YOU PROFIT!** A limited number of machines available on easy payment terms. **NOW** is the time to start. Write today for free literature and full information.

STEEL PIER SENSATION
Luxurious RAINBOW ROCK fireplace wall in living room of the "Home of the Century" in Atlantic City, N. J.'s Steel Pier . . . acclaimed by over 500,000 Summer, 1953 visitors as the most beautiful they'd ever seen! Endorsed by the Pier's famous architect, William F. B. Koelle.

Makes beautiful, decorative fences, garden walls, garages, outside walls, room separators, etc.

GENERAL ENGINES CO., INC.
Dept. SR-47 Route 130
Thorofare, N. J. Tilden 8-5401

MAKE $5 PER HOUR WITHOUT A PRINTING PRESS

PRINTING
REVOLUTIONARY NEW SCREEN METHOD

FREE complete "BIG MONEY" Plan and SAMPLE!

PRINT colorful signs, posters, banners, fabrics, wall paper, show cards—ANYTHING! Print on any surface. NO printing press or special equipment is needed with this amazing "approved" new printing secret. *300% profit* on nearly every job. Easy to learn—NO EXPERIENCE or art ability necessary. Exceptional opportunity. Complete illustrated detailed plan and colorful sample FREE—Write:

SCREEN-PRINT COMPANY Dept. 14
15127 S. Broadway, Los Angeles 61, Calif.

ENGINEERING — DEGREE IN 27 MONTHS
B.S. DEGREE IN
AERONAUTICAL, CHEMICAL, CIVIL, ELECTRICAL, MECHANICAL and ELECTRONIC ENGINEERING (Inc. Radio and TV)

Big Demand for Graduates

Hundreds of young men are earning **B.S. ENGINEERING DEGREES** annually in this recognized Institution—year around classes optional. Also B.S. in 36 mo. in Math., Chem., Physics. New terms start quarterly. Many students earn a major part of their college expenses in this large industrial center. Low tuition. Competent instruction.

Thorough, intense practical program. Modern, well-equipped laboratories including new physics laboratory and modern wind tunnel. Individualized instruction emphasized. Government approved for G.I.'s. Engineering Science preparatory courses.

Students from 48 states and 21 foreign countries. Enter June, September, December and March. Send coupon for free catalog and full information. Enroll now.

INDIANA TECHNICAL COLLEGE
647 E. Washington Boulevard, Fort Wayne 2, Indiana

Please send me free information on *27 Mo. B.S. DEGREES* in:
Aeronautical ☐ Chemical ☐ Civil ☐ Electrical ☐
Mechanical ☐ Electronics ☐
on *36 MONTH B.S. DEGREES* in:
Mathematics ☐ Chemistry ☐ Physics ☐

Name.....

Address.....

AMAZING BARGAINS!

DIRECT FROM IMPORTER TO YOU! $115,000 worth of new, first-quality merchandise at discounts up to 75%! Don't pass up these sensational values. Act now. New shipment from abroad will cost more!

THORESEN, Inc., Dept. 7-D, 585 Water Street, New York 2, N. Y.

SPY CAMERA

Reg. $2.98

$1.98

Take Secret Pictures! **3 FREE GIFTS!** *Handy pigskin leather case & 2 rolls of film!* Precision-made camera, fits in palm of hand. Designed for detective work. Sharp pictures! All metal, chrome plated, genuine coated Minuscus lens! Speed shutter, professional viewfinder, instant & time settings. Thousands sold at much higher prices! **NO. 48** $1.98

$15.00 Value

$6.98

.22 Cal. BLANK **PISTOL**

Made in Germany

For fun, sports, protection against prowlers. Exact dimension, finish and design of death-dealing automatics. Uses only .22 cal. harmless blanks. Chamber gives terrific percussion audible at enormous distances, enough to frighten daylights out of any "character." 6 shot fully automatic magazine. Safety catch. Self-ejecting clip, deluxe Cordovan handle. No permit needed. Can be sent anywhere outside N.Y. state. **NO. 111** $6.98

3 TURRET MICROSCOPE

100X 200X 300X **$7.99**

Reg. $12.95 Value

SAVE $5.00! All metal, precision-tooled threadings, polished Achromatic lenses. Excellent optical instrument for technician or student's gift. Thousands sold at $12.95. You pay $7.99. NO TAX. **NO. 198 $7.99**

Hi-Power—All Purpose

PAINT SPRAYER

Complete— No Extras to Buy!

Lowest price ever! Famous make! Cuts painting time 75%. Takes paints, oils, enamels, etc. Needs no tank or compressor. Cannot clog or drip. People everywhere paid up to $29.95 for this type unit. Our factory-price to you —for complete kit— only $9.95.

NOT $29.95 NOW ONLY $9.95

NO. 102 ..... $9.95

Amazing, Extra-Long Range

POWERHOUSE TELESCOPE

Everything You Can See Brought 15 Times Closer . . . from 1 to **50 MILES!**

Reg. $12.95 *Now Only* **$4.99**

Free tripod

Optical instrument imported direct from Germany. **METAL** draw tubes. Contoured eyepiece. Interior coated objective lenses. High luminosity for moonlight viewing. Jet nubital trim. Precision ground lenses. 225 times area magnification. Formerly $12.95. Save nearly $8.00! **FREE** table tripod and case. While supply lasts! **NO. 43** $4.99

New 4 x 40

POWERHOUSE "77"

$12.95 Value

$4.98

Everything 4 times closer—up to 40 MILES AWAY! Adjusts at once to eye width. Folds in center on swirling pivot. Clearer, sharper views—even in moonlight! UNBREAKABLE LENSES! Made by optical craftsmen in West Germany. $1.98 case FREE. Hurry! Powerhouse "77" is a sell-out every time at this low price. **NO. 160** $4.98

Black Forest HUNTING KNIFE

OVER 100,000 SOLD AT

$3.95

NOW ONLY

99c

10 Inches Overall

Limit of Two to Customer

This is the original and genuine Black Forest—the world's most famous hunting knife. Its rugged beauty has won recognition for design throughout Europe and America. Hand-forged by old world steelsmiths famed for their high standards of craftsmanship! Blade is sharp enough to shave with! Use the Black Forest to skin moose, rabbit, deer, bear, etc. To cut hemp, underbrush, branches, etc. To hunt small game — it makes a silent, accurate weapon! Use it in a hunting emergency — when seconds really count! Use it at home, to carve roasts, turkeys. It makes a handsome den decoration, too!

10 full inches long. Over 100,000 sold at $3.95 —now yours for only 99c! YOU SAVE $3.00! Limit of two to family

Leather Sheath Given **FREE!**

No. 78 ..... 99c

MONEY BACK GUARANTEE!

THORESEN INC., Dept. 7-D
585 Water Street, New York 2, N.Y.

RUSH items listed below on 10-day home trial. My money back if I'm not satisfied.

☐ **Check, cash or money order enclosed. Send prepaid.**
☐ **Send C.O.D., plus postal charges.**

Number	Quantity	ARTICLE	Price

NAME .....

ADDRESS .....

CITY ..... **ZONE** ..... **STATE** .....

Canadians: Address 45 St. James St. West, Montreal 1, P.Q.

MORE THAN 50,000 SOLD AT $3.98

IMPORTED SWISS ARMY TYPE KNIFE

• Saw • File • Scissors
• Jackknife • Screwdriver • Awl
• Can Opener • Bottle Opener
• Corkscrew • Small Knife

Made famous by the Swiss army because it's virtually a lifesaver in many emergencies. 10 practical, quality tools! Each tool is separate; easy to open and close. No jamming! No slipping! Replaces multitude of tools & gadgets you can never find when you need them. Will give lifetime of rugged use. Ideal for outdoor men, "do-it-yourselfers," or just plain Mrs. Housewife!

NO. 18

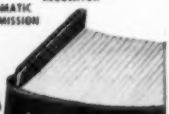
$1.98

Over 50,000 sold at $3.98 now yours at HALF PRICE!

HOW TO FIX ANY PART OF ANY CAR

QUICKLY--EASILY--RIGHT!

FREE 7-DAY TRIAL



MOTOR'S AUTO REPAIR MANUAL

WHETHER you're a beginner or an expert mechanic — now you can "breeze through" any "fix-it" job from simple carburetor adjustment to complete overhaul. Just look up job in index of MOTOR'S Brand-New Auto Repair Manual. Follow simple step-by-step directions, clear pictures. Presto—the job is done!

No guesswork! MOTOR'S MANUAL takes you from "scratch" — shows WHERE to start, WHAT tools to use. Covers EVERY job on EVERY car built *from 1949 thru 1957!*

Everything You Need to Know "Boiled Down" from 160 Official Shop Manuals

BIG NEW, REVISED, ENLARGED, Edition contains the "meat" from over 160 OFFICIAL shop manuals—simplified for YOU. 23,420 co-ordinated repair specifications. Over 1,000 big pages. More than 2,000 "in-a-flash" pictures. 225,000 service and repair facts. Leads beginners every step of the way. Time-saving factory repair procedures for experts. Instructions and pictures so clear you CAN'T go wrong. Used by U. S. Army and Navy.

Brand New—Covers All These Makes

Buick	Jeep
Cadillac	Lincoln
Chevrolet	Mercury
Chrysler	Nash
Clipper	Oldsmobile
Continental	Packard
De Soto	Plymouth
Dodge	Pontiac
Ford	Rambler
Hudson	Studebaker
Imperial	Thunderbird
Willys	

Try Book FREE 7 Days

SEND NO MONEY! Pay postman nothing. Make Manual show you what it's got. Unless you agree this is the greatest time and work saver you've ever seen—return book in 7 days and pay nothing. Mail coupon today to: MOTOR—Book Dept., Desk 24, 250 W. 55th St., New York 19, N.Y.

Same FREE Offer On MOTOR'S New Truck Repair Manual

Covers EVERY job on EVERY popular make gasoline and Diesel truck made since 1946. For FREE 7-Day Trial check proper box in the coupon below.

MAIL COUPON NOW FOR 7-DAY FREE TRIAL

MOTOR BOOK DEPT.
Desk 24, 250 W. 55th St., New York 19, N. Y.
Rush to me at once (check box opposite book you want):

☐ **MOTOR'S *New* AUTO REPAIR MANUAL.** If O.K., I will remit $2 in 7 days, $2 monthly for 2 months and a final payment of 95c (plus 35c delivery charges) one month after that. Otherwise I will return the book postpaid in 7 days. *(Foreign price, remit $9 cash with order.)*

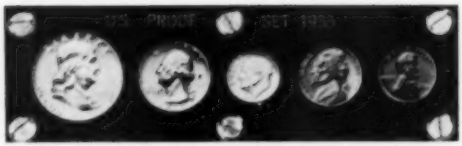
☐ **MOTOR'S *New* TRUCK REPAIR MANUAL.** If O.K., I will remit $2 in 7 days, and $2 monthly for 3 months, plus 35c delivery charges with final payment. Otherwise I will return book postpaid in 7 days. *(Foreign price, remit $10 cash with order.)*

Print Name..... Age.....

Address.....

City..... State.....

☐ **Check box and save 35c delivery charge by enclosing WITH** coupon entire payment of $6.95 for Auto Repair Manual (or $8 for Truck Repair Manual.) Same return-refund privilege.



GROW MONEY AT HOME!

Buy PROOF SETS of Coins—watch them grow rapidly in value!

In 1936 you could buy a Proof Set for $1.81. *Today it is worth over $500,* an increase in value of more than 30,000%.

In July 1956, the 1956 Proof Set cost $2.10. In December, 1956 it sold for $5 to $7, a 300% increase in 6 months.

Your Proof Sets are treasures as investments. Proof coins are *hand-struck* by the Mint, especially for collectors, from highly-polished metal blanks and dies which give the coins a mirror-like finish. Each set contains 5 coins: 1¢, 5¢, 10¢, 25¢, 50¢.

ORDER NOW! 10-day Money-back Guarantee of Satisfaction!

PROOF SETS	Orig. Cost	Value in Dec. 1956	Our Low Price Now
1936	$1.81	$500.00 - 600.00	$- - - -
1950	2.10	55.00 - 65.00	**55.00 ppd.**
1951	2.10	37.00 - 44.00	**37.00 ppd.**
1952	2.10	27.00 - 40.00	**27.00 ppd.**
1953	2.10	15.00 - 22.00	**15.00 ppd.**
1954	2.10	8.50 - 14.00	**8.50 ppd.**
1955	2.10	7.50 - 9.00	**7.50 ppd.**
1956	2.10	5.50 - 6.50	**6.00 ppd.**
1957	- -	- - -	**3.00 ppd.**

SPECIAL: Complete Set 1950-1957 Incl.—**$155.00**

All Orders Postpaid and Insured. BONUS OFFER: with each $50.00 order postmarked before April 30, 1957, we will send you FREE a Plastic Proof Set Holder, value $1.75! ORDER NOW!

POSTAL PRODUCTS COMPANY—Fast Mail Order—Jos. Gordon ANA 11036
5614-S California Street San Francisco 21, California

SHORTHAND in 6 WEEKS

Famous SPEEDWRITING shorthand. 120 words per minute. No symbols; no machines; uses ABC's. Easiest to learn, write and transcribe. Lowest cost. For business and Civil Service. 350,000 graduates. Typing available. 34th year. Write for FREE booklet to: SCHOOL OF

Speedwriting®
Dept. 2604-7, 55 W. 42 St., New York 36

EYE GLASSES *by* MAIL As low as $1.95

WRITE for FREE CATALOG with 14 LENS SAMPLE CARD
Thousands of Customers
Est. 1939

QUALITY READING-MAGNIFYING OR BIFOCAL GLASSES FOR FAR AND NEAR

ADVANCE SPECTACLE COMPANY, Inc.
537 S. Dearborn St., Dept. SP-4 Chicago 5, Illinois

INDUSTRY *NEEDS* TOOL AND DIE DESIGNERS

HIGH PAY—CLEAN, INTERESTING WORK—MAKE $120 FOR A 40-HOUR WEEK!

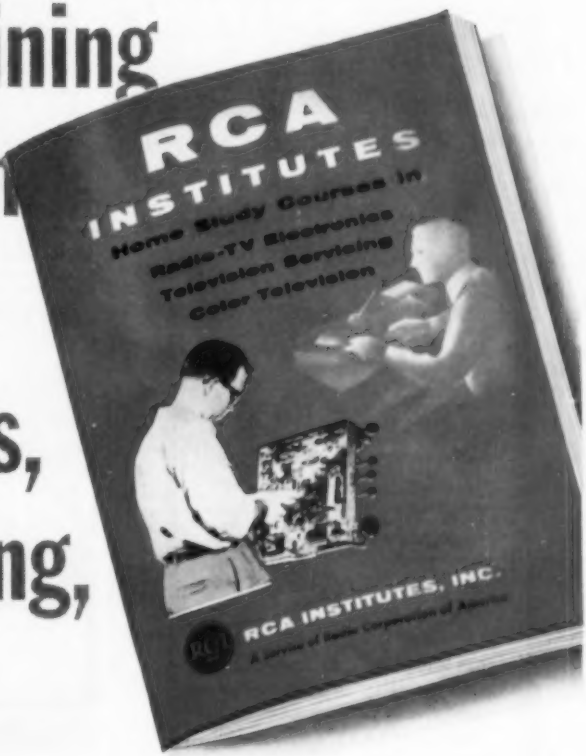
Many Earn much more.

Plenty of job and advancement opportunities! Tool and die designers have always been in demand, and the recent high rate of industrial expansion has created a *real shortage*. Acme School can train YOU for this important field *by correspondence course* (based on our long-established resident schools curriculum). Acme training is *complete* (step right into a paying job), gives you the needed background for fast advancement.

YOU CAN LEARN AT HOME—WRITE TODAY TO

Acme School of Die Design, Inc., Dept. S-3, 8 N. Jefferson St., Dayton 2, Ohio. *Approved for Veterans training.*

RCA offers you the finest training at home in Radio–TV electronics, TV servicing, Color TV



SEND FOR THIS FREE BOOK NOW!

The instruction you receive and equipment you get (and keep) will start you on your way. Pay-as-you-learn. You pay for only one study group at a time. This 52 page book contains complete information on Home Study Courses for the beginner and the advanced student.

RCA INSTITUTES, INC.

A SERVICE OF RADIO CORPORATION of AMERICA

350 WEST FOURTH STREET, NEW YORK 14, N.Y.

In Canada—RCA Victor Company, Ltd., 5001 Cote de Liesse Rd., Montreal 9, Que.

RCA Institutes, Inc., Home Study PS-47
350 West Fourth Street New York 14, N. Y.
Without obligation, send me FREE CATALOG on Home Study Courses in Radio, Television and Color TV. No salesman will call.

Name .....
Please Print
Address .....
City ..... Zone ..... State .....

VETERANS
KOREAN G. I.
P. L. 550
CHECK HERE ( )

Inventors

If you consider your invention valuable, take these necessary preliminary steps promptly to protect it by applying for a United States patent.

Sketch and describe your invention. (For convenience in starting action on your invention, use "Evidence of Invention" form offered below.)

Sign, date and have this invention disclosure witnessed by two people capable of understanding your invention.

Have us make a preliminary search among U. S. patents already granted for similar types of invention.

We then prepare a report for you on the probable patentability of your invention and recommend your further course of action.

This firm is registered to practice before the U. S. Patent Office. We are available to assist you in the preparation and prosecution of your application for patent.

We shall be glad to send you promptly and without obligation, an instructive booklet—"Patent Protection for Inventors"—and our convenient "Evidence of Invention" form.

VICTOR J. EVANS & Co. *Merlin M. Evans*

REGISTERED PATENT ATTORNEY

340-D MERLIN BUILDING, WASHINGTON 4, D. C.

Who Couldn't MAKE UP TO $1,500 in a Month with this Proven "MIRACLE FOR MOTORS?"

Daring "You-Be-Judge" Guaranteed Wins Fast Big Orders from Motorist for Sensational New MOTOR OVERHAUL!

Make biggest money of your life, spare time or full time, introducing amazing new Motor Overhaul in your locality. Needed by 6½ million cars and trucks. Just add to oil, **drive at once;** see, hear, feel **immediate** improved engine performance, more pep, power, and pick-up. Motorists and fleet owners order fast when you say: **"Your money back if, IN YOUR OWN OPINION, you don't get the improvement you expect. You be the judge!"** MOTOR OVERHAUL surprises them, gives **more** than they expect, and they give you big automatic REPEAT ORDER BUSINESS that grows bigger every month! Fleet owners order 6 to 12 dozen at a time at $2.98 each and you make up to $1.78 profit each! **Who couldn't** make up to $1,500 and more in a month with miraculous MOTOR OVERHAUL?

Independent Testing Lab Proves MOTOR OVERHAUL Increases:
- **Motor Compression up to 58%**
- **Gas Mileage up to 54%**
- **Oil-Saving Efficiency up to 900% . . . and**

TESTED AND CERTIFIED

EXTENDS ENGINE LIFE FOR YEARS!

FREE Write NOW for big-profit Sales Kit, everything you need for lifetime business introducing MOTOR OVERHAUL in your area—money-making plans, copy of Lab Test Report, "You-Be-Judge" Guarantee. All FREE.

POPE CHEMICAL CO., 224 W. Huron St., Dept. S-4, Chicago 10, Ill.

AMAZING NEW "LIFETIME" RADIO

GUARANTEED TO WORK FOR YOUR LIFETIME! USES NO TUBES, BATTERIES OR ELECTRICAL PLUG-INS. Never runs down! SMALLER THAN A PACK OF CIGARETTES! RECEIVES LOCAL RADIO STATIONS MOST ANYTIME ANYWHERE WITHOUT EXTRA ANTENNA. Uses perma-crystal diode Hi-Q Tuner—Built-in SPEAKER-PHONE. Beautiful Black-gold plastic case.

Send only $2.00 (bill, ck, mo.) and pay postman $4.99 COD on arrival or send $6.99 for postpaid delivery. SENT COMPLETE READY TO LISTEN—NOTHING EXTRA TO BUY EVER! (Extra long distance aerial kit included free to receive stations up to 1,000 miles away!) Available only from:

MIDWAY COMPANY DEPT. WPS-4 KEARNEY, NEBR.

YOU BUILD 'EM—WE SELL 'EM EARN UP TO $50.00 A DAY AT HOME

Participate in our national sales and sub-contract plan—spare time—full time. You assemble special luggage and cases for photographers, musicians, salesmen, and all types of portables. We supply complete instructions—materials—tools—everything. No previous experience necessary. Free details. Abarsl Casecraft, Dept. CD, 807 W. Sunset Blvd., Los Angeles 12, Calif.

THIS "TOMMY GUN" CAN BE YOURS!

ORDER DIRECT $5.95

WOOD WITH METALLIC FINISH
Authentic in detail

Brand new kit. Machine work done. You need only a pen knife to finish. Order now. Send 15c for new catalog.

FULL SIZE
Also 9 other models
M Carbine 5.95
FBI .357 Magnum 4.00

O'BRIEN GUNCRAFT P.O. Box 657 MADISON, WIS.

CURE "LAWN" BACKACHE!

Do all your lawn trimming and edging jobs . . . standing up! An hour's work in five minutes, with

Trim Master Electric

LAWN TRIMMER AND EDGER

BANTAM $24.95
TRIM MASTER $39.95

ORDER BY MAIL
under money back warranty.

WARREN SALES CORP.
Cranford 27, N. J.

C-10

Beauty by Colorcrete Can Earn High Incomes

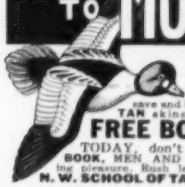
Beautifying buildings by Colorcrete is a business opportunity awaiting man of modest capital everywhere. Owners of homes, stores, motels, schools — almost any type of construction—are looking for means to give lifetime eye-appeal to drab or dirty concrete, stucco and similar masonry surfaces. Colorcreters can do such jobs, in little time and at little cost, and pocket generous profits. Colorcrete is a cementitious material, applied by air pressure. Tough, tenacious, enduring; 30 colors. Investigate this low-investment enterprise by writing for the Opportunity Book.

COLORCRETE INDUSTRIES, INC.
572 Ottawa Ave., Holland, Mich.

COLORCRETE

CANADA: 1022 Dundas Highway, Cooksville, Ont.

LEARN TO MOUNT BIRDS



ANIMALS, FISH, PETS

Be a Taxidermist. Save your hunting TROPHIES. Have a fine home-museum. Hunters, save and **MOUNT** your beautiful DUCKS, QUAIL, DEER, **TAN** skins, FURS. **Great Fun.** Spare-time **PROFITS.**

FREE BOOK Tells ALL about it. 100 fine wild-game pictures, 48 pages. SEND TODAY, don't delay. Get this WONDERFUL **FREE BOOK,** MEN AND BOYS. Learn Taxidermy. Double your hunting pleasure. Rush letter or **POSTAL** today. **STATE YOUR AGE.**

N. W. SCHOOL OF TAXIDERMY, Dept. 2604 Omaha, Neb.

LAW FREE BOOK

THE LAW TRAINED MAN

Write today for a FREE copy of illustrated law book, **"THE LAW-TRAINED MAN,"** which shows how to earn the professional Bachelor of Laws (LL.B.) degree through home study of the famous Blackstone Law Course. All necessary books and lessons provided. Moderate cost; convenient monthly terms. Write for FREE law training book today.

Blackstone School of Law, 225 N. Michigan Ave.
Founded 1890 **Dept. 124 Chicago 1, Ill.**

LEARN APPLIANCE REPAIR IN SPARE TIME AT HOME

START YOUR OWN BUSINESS

50,000,000 POTENTIAL CUSTOMERS

New shop-method, home-training system gives you electrical know-how that used to take years to learn. Learn by building valuable testing kits, repairing your own and neighbors' appliances. Appliance repairmen often charge on the basis of $5.00-$6.00 an hour!

FREE BOOK

FREE ILLUSTRATED BOOK

Shows you how you learn every phase of electrical appliance repair. How to make money while you learn. Write today for your FREE copy.

CHRISTY TRADES SCHOOL, Dept. D-7401
4804 N. KEDZIE AVE. CHICAGO 25.

MAKE MORE MONEY get into

TELERAMA • ALL 8 BRANCHES OF TELEVISION ELECTRONICS • RADIO •

IN **ONE** DYNAMIC, MODERN SHOP METHOD, HOME TRAINING COURSE

You get and keep ALL this modern, newest, practical equipment!

* Registration applied for

YOU COVER ALL 8 BRANCHES IN ONE MASTER COURSE, ONE LOW TUITION

1. Television-including color TV
2. Radio — FM & AM
3. Industrial electronics
4. Sound recording and Hi-Fidelity
5. Preparation for FCC License
6. Automation
7. Radar & Sonar
8. Communications

- **Parts to build a modern TV set, including large screen Picture Tube.**
- **Parts to build a powerful Superhet Receiver, standard broadcast and short wave.**
- **Parts to conduct many experiments and build — • Continuity Checker • RF Oscillator • TV Circuits • Audio Oscillator • TRF Receiver • Signal Generator**
- **Professional Multitester**
- **A MUST for all technicians**

FOR MEN WHO WANT TO EARN MORE MONEY! Another great advance in Home Study Training. Let National Schools, of Los Angeles, a practical Technical Resident Trade School for over 50 years, train you at home by Shop-Method, for today's unlimited opportunities in ALL 8 BRANCHES of the Television, Electronics, Radio industry.

YOU DO MANY PRACTICAL JOBS — including servicing, circuit analysis. Build a modern TV set from ground up, with equipment kits we send you, including a new large-screen picture tube and professional Multitester, at no additional charge. You receive an experiment lesson with each kit. **EARN AS YOU LEARN.** Graduate Employment Service.

SEND FOR FREE FACT-BOOK AND SAMPLE LESSON

RESIDENT TRAINING AT LOS ANGELES. If you wish to take Resident Training at Los Angeles in our big, modern Shops, Labs, and Studios check special box in coupon for full information.

NATIONAL SCHOOLS
4000 S. FIGUEROA ST., LOS ANGELES 37, CALIF.
187 N. LA SALLE ST., CHICAGO 1, ILL.

NATIONAL SCHOOLS
TECHNICAL TRADE TRAINING SINCE 1905
Los Angeles, California

GET FAST SERVICE — MAIL NOW TO OFFICE NEAREST YOU!

NATIONAL SCHOOLS, DEPT. RC-47
4000 S. FIGUEROA ST. LOS ANGELES 37, CALIF. OR 187 N. LA SALLE ST. CHICAGO 1, ILL.

Rush free TV-Radio "Opportunity" Book and sample lesson. No salesman will call

NAME _____ BIRTHDAY _____ 19__

ADDRESS _____

CITY _____ ZONE _____ STATE _____

☐ Check if interested ONLY in Resident School Training at Los Angeles

VETERANS: Give date of discharge _____

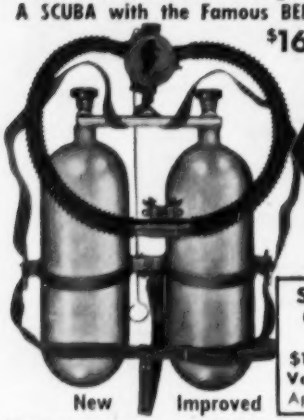
BUY DIRECT from MAKER and SAVE!

COMPLETELY AUTOMATIC "SEA-HORSE" DIVING LUNGS

INCREASED PRODUCTION brings NEW LOW PRICES

A SCUBA with the Famous BENDIX REGULATOR

$169 VALUE



2-TANK UNIT 89.75
COMPLETE
Approx. 2 Hours Underwater Time

Ready to Use

SINGLE TANK Outfit Complete
$110 Value **69.95**
Approx. Time 1-Hour

New Improved

The 2-stage demand REGULATOR automatically releases air as needed; effortless breathing in any position, includes emergency device to release reserve air for surfacing; I.C.C. approved tanks . . 84 cu. ft. cap. at 2000 psi; non-return mouthpiece keeps water out of hose; adjustable harness. 2-Tank wt. 55 lbs. 1-Tank 30 lbs.

GUARANTEE of SATISFACTION of PERFECT PERFORMANCE with each "Sea-Horse" Diving Lung

FREE Valuable Booklet on SAFETY in Skin Diving with each Diving Lung. Full Instructions included.

Send Check or Money Order. If C.O.D., 25% with order

Shipping Points: Chicago, Pittsburgh, New York

Also available: Re-Breather type Diving Lungs, Spear Guns, Diving Suits and All Swim Accessories

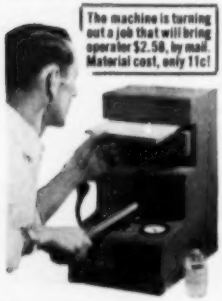
Write for Free Literature Today . . . Club Inquiries Invited

DIVING INDUSTRIES Division of HONUS WAGNER CO.
Quality Sports Products Since 1918
813 LIBERTY AVE. DEPT. PS-4 PITTSBURGH 22, PA.

MAGIC MAIL PLAN

that comes with this Little Machine

CAN MAKE YOU $5.00 AN HOUR



Write today for free facts about the newest and most fascinating of all new home operated businesses. For the first time, a simplified machine brings the fabulous profits of Plastic Sealing and Plastic Laminating within reach of the small operator. Anyone can learn to operate it with a few minutes practice. Then—with our MAGIC MAIL PLAN—can get mail orders pouring in daily with cash in every envelope.

No Canvassing or Selling

Fill orders at home in spare time to start. Then expand to full time business. We even supply circulars to bring back cash and orders. Rush name for all the facts you need to start. A postcard will do. No charge.

WARNER ELECTRIC CO., Dept. L-9 D
1512 Jarvis, Chicago 26, Illinois

Start TODAY to enjoy an exciting new hobby! Get this big, valuable collection of gorgeous, multi-colored triangle shaped postage stamps . . . brought to you from strange and mysterious lands in the wilds of Africa, enchanting Europe, exotic Latin America, etc. All genuine, all-different—picturing man-eating reptiles, jungle birds, action-packed sports, ancient clipper ships; PLUS scarce airmails, fabulous commemoratives, giant and midget-sized stamps. EXTRA! Bargain Catalog, "Collector's Manual" plus other exciting offers for your inspection. Enclose 10c for mailing costs Supplies limited. ACT NOW!

JAMESTOWN STAMP CO., DEPT. H4PS. JAMESTOWN, N. Y.

RETRACT-A-PEN RIOT! Prices Slashed to New Low!

REFILLS (49c Value Each) **10 for only $1.00** to fit ALL retractable pens (except Parker Jotter). Choice of Red, Blue, Black, Green or Brand New BROW'N ink.

($1.79 Value each) **RETRACTABLE PENS** **5 for only $1.00** (100 for $18) Choice of Red, Blue, Black or Green Ink! Barrels in asst'd colors. Will not leak, smear or transfer. Send check or M.O. Add 10c for shipping. Money back guarantee. Quantity and imprint prices on request.

Barclay Distributors, Dept. 623, P. O. Box 45, Forest Hills, N.Y.

WORLD'S LOWEST PRICED ADDING MACHINE

Vest Pocket Size FREE TRIAL **$2.95** only TOTAL COST SEND NO MONEY

COUNTS UP TO 999,999,999
IDEAL FOR BUSINESS AND PERSONAL USE—GUARANTEED ACCURATE.
Not a toy. Operates with only a finger flick. Adds, subtracts, multiplies, divides. Counts up to one billion. Pays for itself over and over. Ideal Gift—for Business, Income Tax and School use. MONEY BACK GUARANTEE. Send name and address. Pay postman only $2.95 plus postage. Beautiful rich-looking Leatherette Case included at no extra cost. Money back in 10 days if not delighted. AGENTS WANTED.

CALCULATOR MACHINE CO., (Mfgrs.)
Box 126 Dept. CJ-57 Huntingdon Valley, Pa.

LEARN METALCRAFT and JEWELRY MAKING

Low Cost Home Training Now Available

Make money. Learn profitable skills and arts of decorative metal and jewelry crafts. Course is complete. Professionally prepared. Easy to master. Special tools and materials furnished.

Write for Free Booklet **INTERSTATE TRAINING SERVICE** DEPT. K-2 PORTLAND 13, OREGON

WHEN FALSE TEETH CAUSE SORE GUMS

You get undreamed of relief in seconds! Medically-formulated NUM-ZIT *Adult Strength* has already brought blessed relief to thousands. Recommended by dentists everywhere. Pleasant-tasting . . . eases discomfort while you break in new false teeth. Works wonders, too, for relief of toothache, neuralgic pains. Keep it handy for quick first aid. *At all drug counters.*

NUM-ZIT *Adult Strength*

Another fine Purepac product

college graduates get ahead faster!

You see it in your own city. They have higher incomes . . . advance more rapidly. Grasp *your* chance for a better life. Industrial growth . . . automation . . . technical advances create career opportunities for engineers, accountants, management experts. Share rewards awaiting college-trained men. Important firms visit campus regularly to employ Tri-State College graduates. Start any quarter in this world-famed college. *Approved for veterans.*

Bach. of Science degree in 27 months

in Mechanical, Civil, Electrical, Chemical, Aeronautical, Radio (TV-Electronics) Engineering. *In 36 months a B.S. in Business Administration* (General Business, Accounting, Motor Transport Management majors). Superior students may accelerate. 36-weeks course in Drafting. *Intensive program:* technical fundamentals stressed; comprehensive courses with more professional class hours. *Small classes:* personalized instruction. Enrollment limited to 1550. Preparatory courses. *Beautiful campus.* Well-equipped, new and modernized buildings and laboratories. Enter June, Sept., Jan., March. Earnest, capable students (whose time and budget require accelerated courses and modest costs) are invited to *write Jean McCarthy, Director of Admissions, for catalog and book "Your Career in Engineering and Commerce."*

TRI-STATE COLLEGE

547 College Avenue — Angola, Indiana

NEW! RIDING MOWER

Bready's brand new, full 3.6 HP riding rotary mower gives you easiest, trouble free operation: — smooth 270° steering — adjustable blade height 2" to 4" — throttle controlled speeds 0 to 7 mph — 3 gears forward, neutral, reverse — 10" x 4" pneumatic tires — SAFE! all working parts enclosed.

FREE! WRITE FOR CATALOG OF COMPLETE BREADY LINE.

BREADY TRACTOR CO.

335 AURORA ROAD • SOLON, OHIO

BECOME AN EXPERT IN TRAFFIC *and* TRANSPORTATION

Traffic men earn $4,000 to $10,000 and up. Thousands of firms need experts on rates, tariffs, regulations. We train you thoroly in spare time at home for executive traffic jobs. Personal training under traffic authorities. Write for free book "Traffic and Transportation."

LASALLE Extension University, 417 So. Dearborn St.
A Correspondence Institution. Dept. 483 T, Chicago 5, Ill.

STUDY TO BE A DOCTOR *of Psychology or Metaphysics*

Obtain a Ph.D., Ma.D., or Ph.D. Be a Teacher, Lecturer or Accredited Practitioner. Teach others how to achieve Health, Happiness and Contentment. Chartered by State. Correspondence courses only. Write for FREE book telling how.

THE NEOTARIAN FELLOWSHIP

Desk 5, Pickwick Building — Kansas City 6, Missouri

Day or Night — Enjoy this HIGH-POWERED 40, 80, 120 TELESCOPE with TRIPOD

$12.95 ppd.

Observe stars, moon, planets. See distant ships, people, etc. appear feet away! Crystal-clear image sharpness at all powers. All images erect. Telescope, with five precision lenses and 40" long black leatherette covered tube mounted on 5 ft. hardwood tripod, cast aluminum head. Vertical and horizontal movements machined aluminum, tension controls on each. 5X finder scope attached locates target fast. Telescope completely assembled with tripod PLUS 3 FREE GIFTS only $12.95 postpd. Satisfaction guaranteed.

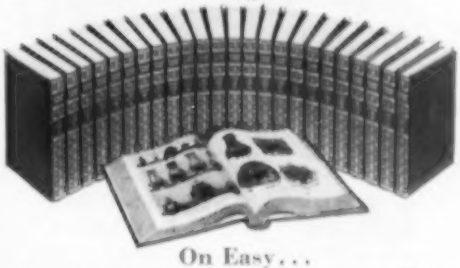
GET THESE GIFTS FREE!
1. 120 pg. book "Discover the Stars"
2. StarFinderDial
3. 200 & 400X eyepiece lenses

SUFFOLK SCIENCE SERVICE
Dept. PS-4 — Mattituck, N. Y.

Now available—direct to you from the Publisher

BRAND NEW EDITION OF THE WORLD FAMOUS

ENCYCLOPAEDIA BRITANNICA



On Easy . . .

Book a Month Payment Plan

All 24 Volumes Delivered Immediately—
You Pay *Later* on Easy-to-Own Purchase Plan

Yes, the latest edition of Britannica—the greatest treasure of knowledge ever published—is now being offered on a remarkable plan that puts this world-renowned reference library within reach of *every* family. All 24 volumes will be placed in your home NOW...you pay for it as you enjoy it...*as easy as buying a book a month!*

New Edition is Profusely Illustrated

The new Britannica almost "televises" the information to you by means of 23,494 pictures, plus charts, maps and drawings. But it does not merely show "attractive" pictures—it is the work of 5,565 of the world's best minds. The final authority on factual knowledge; a constant inspiration that will enrich the lives of yourself and your family.

Preview Booklet Offered FREE!

Simply fill in and mail the coupon today, and we will send you...*without cost or obligation*...a copy of our beautiful, new booklet which contains an exciting preview of the latest edition of Encyclopaedia Britannica. Send no money—not even for postage. It's yours, *absolutely free!*

Just as soon as we receive your coupon, we will send your illustrated free booklet, so that you can read and enjoy it at your leisure, in the privacy of your home. There is no obligation, of course. However, since this offer is necessarily limited, please mail coupon *today* before it slips your mind.

Mail Coupon NOW for FREE Booklet!

ENCYCLOPAEDIA BRITANNICA, DEPT. 75-F
425 N. Michigan Avenue, Chicago 11, Ill.

Please send me the FREE Preview Booklet and information on how I may obtain the ENCYCLOPAEDIA BRITANNICA, direct from the publisher, on the Book a Month Payment Plan.

NAME.....

ADDRESS.....

CITY..... STATE.....

IN CANADA, WRITE E.B. LTD., TERMINAL BLDG., TORONTO, ONTARIO

YOU can acquire

LAW NIGHTS AT HOME! LL.B. DEGREE

LaSalle's famous Law Library—used as reference in many Law libraries and Law offices—has enabled thousands to master Law surprisingly fast, in spare hours at home, for business and professional advancement.

These 14 remarkable volumes, compiled by leading professors and lawyers, cover the whole basic field of Law in condensed, orderly, simplified manner.

You advance rapidly with this great library, plus special lectures furnished. We guide you step-by-step with personalized Problem Method of instruction . . . you *learn by doing*—handling legal problems—not by memorizing rules.

Send for two FREE booklets, "Law Training for Leadership," and "Evidence," answering questions about Law and its value to you, and telling how LaSalle Law graduates are winning rapid advancement in business and public life. Mail coupon below. No obligation.

LA SALLE EXTENSION UNIVERSITY
A Correspondence Institution
417 S. Dearborn St. Dept. 483L Chicago 5, Ill.

Send me your two FREE booklets described above, without obligation.

Name.....*Age*.....

Street.....

City, Zone & State.....

Bird Baths
Jars and Vases
Flower Boxes
Flagstones
Lawn Seats
etc. etc.

Spare-Time Income from Gardencrete

Wherever there's pride of home, there's a place for Gardencrete. That's why the sales field is so broad, and so rich in profit potentials.

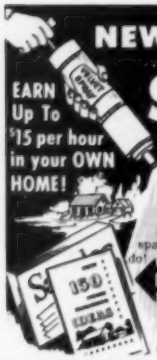
Gardencrete is basically made of cement and sand, then Colorglazed in a choice of 30 attractive colors that stay new. Easily washed or scrubbed. Add beauty to every lawn and garden.

On a small investment for molds and Colorglazer you can develop a line of products that sell for two or three times your cost of materials and labor. Easily made in shed or garage. We supply full instructions.

Write for book "Make Money." Describes equipment and gives figures on costs and selling prices on dozens of different items.

Colorcrete Industries, Inc.
711 Ottawa Avenue, Holland, Mich.

The Bird Bath shown above, sells for $6.50. Cost of materials and labor, $2.26. Your mark-up, $4.26.



NEW MIRACLE MONEY SPRAY... Startling NEW

EARN Up To $15 per hour in your OWN HOME!

"Velvet-Like" spray discovery! Instantly, you can spray ordinary objects (lamps, figurines, signs, cards, glasses – anything!) and change them into beautiful expensive masterpieces that feel like rich velvet to the touch. It's amazing but true! Men and women urgently wanted to introduce this new process to their areas. Work at home during spare time and earn big money. It's fun, fascinating to do! No big investment needed–we supply everything.

FREE Booklet and Actual Samples Includes revealing Home-Business profit plan secrets and Real samples in 16 different colors—all Free! **RUSH YOUR NAME & ADDRESS TODAY—supply limited!**

Coast Industries, Dept. A-4, Los Angeles 61, California

$6,000-$10,000 YEARLY OPERATING AUTO RADIATOR SERVICE SHOP

World's largest radiator shop equipment mfgr. will assist responsible individuals in setting up radiator shops. Opportunity to own secure profitable business. First year averages $6,000 to $10,000. Garage or service station can operate as dept. Over 1,000 INLAND shops now operating. As little as $295 down for equipment starts you. INLAND will finance balance and furnish training. Write to

INLAND MFG. CO., Dept. PS-4, 1108 Jackson St., Omaha 2, Nebr.

RUPTURED

BE *FREE* FROM TRUSS SLAVERY

Now there is a new modern **Non-Surgical** treatment designed to permanently correct rupture. These **Non-Surgical** treatments are so certain, that a Lifetime Certificate of Assurance is given.

Write today for our New FREE Book that gives facts that may save you painful and expensive surgery, and tells **how non-surgically** you may again work, live, play and love and enjoy life in the manner you desire. There is no obligation.

Excelsior Hernia Clinic, Dept. 3705, Excelsior Spgs., Mo.

100 POUND SET $11.80

Extra Plates Only 10c Pound

BARBELLS

140-Pound, CHROME DELUXE Barbell-Dumbbell set only **$18.80.** This is *our* feature set and is the finest ever manufactured.

Training with adjustable weight is the **BEST** way to keep fit; the **ONLY** way to develop great strength and a perfect body. As the oldest and best equipped barbell company, BUR gives value and prices no one can equal.

SEND FOR FREE CATALOG.
BUR BARBELL CO.
Lyndhurst 5, New Jersey

You can make money in

WATCH REPAIR

Learn at home the low cost Sweazey Way

Watch repairing pays up to $6 an hour, part time watch makers report on survey. Unique and modern Sweazey home study System starts you making repairs right away on Swiss and American watches. Professionally prepared training. No previous experience needed. Special tools provided for practice. Tuition only $5 a month. Free sample lesson and opportunity book give all facts. Write today. No obligation.

CHICAGO SCHOOL OF WATCHMAKING
2330 N. Milwaukee Ave. Dept. 447 Chicago 47, Illinois

NOW IT'S EASY TO LEARN

DRAFTING

AT HOME - QUICKLY - IN YOUR SPARE TIME

HERE'S YOUR CHANCE! No matter where you live . . . no matter what your present job is, you too can soon be cashing big pay checks and enjoying an assured future in drafting! Never before has there been such a demand for trained draftsmen . . . the key men in all industry. No profession has a brighter future! Draftsmen get top pay . . . are in line for promotion to executive positions.

NO EXPERIENCE NEEDED! Cleveland Engineering Institute Courses are the most modern, practical, thorough, drafting courses available. They are fully illustrated; prepared especially for Home Study. If you can read this ad, you can learn drafting under C.E.I.'s guidance. Ours is a tested, proven, up-to-date course that has helped thousands of others on the road to success (many with only grammar school training).

EARN WHILE YOU LEARN! Keep your present job while learning drafting at home in your spare time at the speed that is best for YOU. Many students, as they advance, earn extra money by doing part-time drafting. Many graduates earn more in a single week, as draftsmen, than the entire cost of the course.

FREE! After you graduate, 50 hours of extra training at the Institute in Cleveland. This post-graduate training is optional.

WE HELP YOU GET THAT JOB! After you have graduated, C.E.I. will help you find a position. Our Job-Finding-Service is the only one of its kind offered by a Home Study School.

WHAT CAN DRAFTING OFFER YOU? Find out how a C.E.I. DIPLOMA can bring you a better life — more security — the respect of your employer and people in your community. Without obligating yourself in any way, write for the Cleveland Engineering Institute Success Book and a Sample Lesson FREE. Industry needs men of action! This means YOU.

After completing the C.E.I. course I became foreman . . . salary increased 50%. — Wm. Reichers

First job after taking C.E.I. course increased my salary from $350 to $820 per month. — G. T. Wiseman

Thanks to C.E.I. I was promoted ahead of 4 other men with a good pay increase. — W. K. Andersen

The drafting job I got with C.E.I.'s assistance has given me a real start. — R. Eisenbart

PROFESSIONAL EQUIPMENT included at no extra cost!

VETERAN APPROVED

CLEVELAND ENGINEERING INSTITUTE

MAIL THE COUPON RIGHT NOW

CLEVELAND ENGINEERING INST., Dept. PS 4G
6300 Euclid Ave. Cleveland 3, Ohio
FREE Success Book & Sample Lesson.
Write today! ☐ Aeronautical ☐ Mechanical

My Name .....

Address .....

City ..... Zone .... State .....

BUILD IT YOURSELF

Heathkit

BROADCAST BAND

RECEIVER KIT

MODEL BR-2

$19.25 *incl. fed. excise tax* (Less Cabinet)

SHPG. WT. 10 LBS.

Have you ever experienced the thrill of building your own radio? Invest a few of your dollars—a few hours of your time, and build a truly worthwhile broadcast band receiver. Transformer operation eliminates potential shock hazard characteristic of "economy" AC-DC sets. Operates as radio, phono, amplifier, or tuner. Fine tone quality, excellent sensitivity. Simplified Construction Manual outlines basic theory of radio principles. Actually a radio course in itself. Price includes tubes—speaker—chassis, etc. Every part you need! Order your Heathkit Radio Kit today.

OTHER "BUILD IT YOURSELF" *Heathkits*

- Oscilloscope
- Vacuum Tube Voltmeter
- Signal Generator
- Amateur Transmitter
- Communications Receiver
- Multimeter
- Handitester
- Hi-Fi Amplifier
- Hi-Fi Preamplifier
- Battery Eliminator
- Signal Tracer
- Tube Checker

(and over 50 others)

WRITE FOR Free CATALOG

HEATH COMPANY
A Subsidiary of Daystrom, Inc.
BENTON HARBOR 16, MICH.

TRAINED MEN NEEDED!

BIG PAY!—GOOD FUTURE!

☐ DIESEL ☐ ELECTRONICS
☐ AUTO ☐ AUTOMATION

NEVER BEFORE has the opportunity been so good for the properly trained mechanic and technician to step into BIG PAY POSITIONS with rapid advancement and future security virtually assured.

YOUR SUCCESS depends on the quality of training you receive . . . and the reputation of the school you attend.

YOUR GUARANTEE we are giving the best in mechanical and technical training is proved by the fact . . . we have a waiting list of good pay positions for our graduates, with leading companies throughout the United States.

RESIDENT SHOP TRAINING is easier and costs less than you may think! We provide you with housing and part-time jobs while in school, plus free nation-wide placement service for graduates.

Check subject above in which you are interested and mail for

FREE BOOKLET

Your Future in ELECTRONICS and AUTOMATION

BAILEY Technical Schools
Veteran Approved
1650 S. Grand, St. Louis 4, Mo.

Your Future in DIESEL and AUTO MECHANICS

Name _____ Age _____
Street _____
Town _____ Zone _____ State _____

It's easy . . .
you do all 3

with the

BOLENS

CONVERTIBLE *Power-Pak*

Here's real economy . . . one engine does the work of three! Bolens Power-Pak engine-handle unit changes from mower . . . to tiller . . . to snow plow . . . in a jiffy—makes *fun* of your outdoor chores. 5 attachments—3 rotary mowers, rugged tiller and efficient rotary snow caster. *Easy time payments.*

Try the Power-Pak . . See Your Bolens Dealer

SEND POSTCARD FOR CATALOG

BOLENS PRODUCTS DIVISION
Food Machinery & Chemical Corp.
Port Washington 2, Wisconsin

EVERYTHING YOU NEED TO ENJOY STAMP COLLECTING for 25¢

LARGE ALBUM & STAMP COLLECTION, Hinges & Midget Encyclopedia

1) LARGE ILLUSTRATED ALBUM. Spaces for thousands of stamps from all over the world. Hinges too. A happy home for your stamps for years.

2) VALUABLE COLLECTION OF STAMPS. MONACO—Grace Kelly Wedding Stamp-of-the-Year. Korea, many more. 107 all different.

3) MIDGET ENCYCLOPEDIA – STAMP DICTIONARY – STAMP IDENTIFIER.

Total value $1.25 — only 25¢ to introduce our bargain approvals. Money back guarantee. SEND 25¢ TODAY. ASK FOR LOT EH-27

ZENITH CO. 81 WILLOUGHBY ST. B'KLYN 1, N. Y.

MAKE MORE $ IN SPARE TIME HOURS!

Use "IDEAL" Lawnmower Sharpener

New attachment makes Model 300 "Ideal" a perfect reel and rotary blade grinder—also sharpens shears, other tools! Ideal's exclusive "hook" grinding method insures quick, easy results every time. Compare all facts and you'll buy "Ideal" — leading mower sharpener for 55 years. Make more money —write for free catalog.

The FATE-ROOT-HEATH Co., Dept. PS-4, Plymouth, Ohio

2 WAY PORTABLE RADIO SET!

SENDS—RECEIVES UP TO 10 MILES AS SHOWN with built-in antenna or hundreds of miles with outside antenna! 80 and 40 meter amateur radio bands (novice) also Aircraft and overseas broadcasts (3 to 8 mc.) PORTABLE SELF-CONTAINED POWERED WITH STANDARD LONG LIFE, PORTABLE RADIO BATTERIES. NO AC PLUG-INS NEEDED! Take it with you everywhere you go—on trips, vacations, camping—Keep in contact with home, friends. Has 5 watt crystal controlled transmitter—Sensitive Regenerative Receiver. Send-receive switch. Wt. only 3 lbs. Size, only 6"x4"x4". TESTED—PROVEN—SIMPLIFIED—PRACTICAL—Full information given on quick easy to get license.

SEND ONLY $3.00 (bill, ck., mo) and pay postman $17.95 C.O.D. postage on arrival or send $14.95 for postpaid delivery. Complete kit includes all parts, tube, coils, plastoid cabinet, easy instructions. (Set of batteries—$2.75; crystal $1.25). COMPLETELY WIRED AND TESTED POSTPAID $19.95. A regular $49.95 value—Order now before price goes up.

GUARANTEED—AVAILABLE ONLY FROM:
WESTERN RADIO, Dept. BNS-4, KEARNEY, NEBR.

BUY IT WHOLESALE!

GET UP TO 40% OFF

☆ Start a Buying Service at Home. SPARETIME, GET BIG-NAME MERCHANDISE FOR SELF AND CLIENTS UP TO 40% LESS THAN REG. PRICE. SALES EASY, AS YOU CAN GIVE SIZEABLE DISCOUNTS, STILL MAKE FAT COMMISSIONS. *Post Card brings FREE COPY "The Wholesale Plan".*

FREE! "THE WHOLESALE PLAN"

American Buyers Service

HERTEL STATION, DEPT. PS, BUFFALO 16, N. Y.

FREE—Amazing Book on

RHEUMATISM, ARTHRITIS

If you suffer aches, pains and discomforts of Rheumatism, as manifested in ARTHRITIS, NEURITIS, SCIATICA or LUMBAGO, send today for this FREE Book. It reveals important facts about why drugs and medicine give only temporary relief without removing cause. Explains a proven, specialized system of treatment that may save you years of distress. No obligation. Write for this FREE Book today!

BALL CLINIC, DEPT. 36, EXCELSIOR SPRINGS, MO.

Become A - - -

BUILDING CONTRACTOR!

MAIL COUPON for FREE BROCHURE

Simplified home study training program. Learn every phase of building, estimating, contracting. Fortunes are made in this line of work every year. Use spare hours—no interference with present work. Diploma awarded. Low tuition rates.

AMERICAN TECHNICAL SOCIETY
Dept. PS-457, 850 E. 58th Street, Chicago 37, Ill.

Please send me your FREE Brochure and full details of your building, estimating and contracting training program.

Name _____

Address _____

City _____ State _____

READY CUT HOMES

$2150 AND UP DIRECT FROM MILL

YOU SAVE the items which help make today's building cost expensive: high labor cost, contractor's profit and overhead, insurance, architect's fees. Cut-to-Fit eliminates usual lumber and material waste, also costly mistakes. Anyone can assemble. Simple, easy-to-follow plans furnished and each part numbered. Complete with all lumber, roofing, nails, glass, hardware, paint, doors, windows. Freight paid. Low-cost building plans sold separately if desired. 57 Homes and Floor Plans.

3 EASY PAY PLANS
COLOR CATALOG
Send 25c

INTERNATIONAL MILL & TIMBER CO.
Dept. PS-47 Bay City, Mich.

See Stars Close Up!

3" "PALOMAR, JR." TELESCOPE

60 & 120 Power—An Unusual Buy!

You'll see the Rings of Saturn, the fascinating planet Mars, huge craters on the Moon, Star Clusters, Moons of Jupiter in detail, tremendous Aluminized and overcoated 3" diameter high-speed f/10 ventilated mirror. An Optical Finder Telescope, always so essential, is also included. Sturdy, hardwood, portable tripod. Order by Stock No.—Send check or M.O.—Money-back guarantee! Stock No. 85,050 X. . . . . **$29.50** f.o.b. Barrington, N.J.
(Shipping wt. 10 lbs.)

Ask for FREE catalog N
EDMUND SCIENTIFIC CO., Barrington, N. J., U. S. A.

★ WORK FOR UNCLE SAM ★

TRAIN FOR GOV'T. JOBS! AS HIGH AS $4,080.00 YEAR TO START. Men, women, 18-55. Experience often unnecessary. Write immediately for FREE 36-PAGE BOOK with list of many positions, salaries, sample tests, and full particulars telling how to qualify for them. (Not Gov't. Sponsored)

Franklin Institute, Dept. F-90, Rochester 4, N. Y.

REAL ESTATE
BE A BROKER

PAYS BIG! SEND FOR FREE, BIG, ILLUSTRATED CATALOG NOW! Graduates report making substantial incomes. Start and run your own business quickly. Men, women of all ages, learn easily. Course covers Sales, Property Management, Appraising, Loans, Mortgages, and related subjects. **STUDY AT HOME** or in classrooms in leading cities. Diplomas awarded. Write TODAY for free book! No obligation.

FREE BOOK TELLS HOW

Approved for World War II and Korean Veterans
WEAVER SCHOOL OF REAL ESTATE (Est. 1936)
2020S Grand Ave. Kansas City, Mo.

$8 750 FIRST YEAR—IN YOUR OWN BUSINESS

Start Part Time—We Furnish Everything

We locally train you to run your own business, furnish all equipment and supplies to clean and moth-proof rugs and upholstery ***on location*** by world-wide process. No shop needed, you become quickly established. Just **2** average jobs a day bring $8,750.00 NET profit in year. Employ others and ***multiply*** your earnings. As member of world's largest organization of its kind you are backed by National Advertising, receive 25 regular services to help build your business. You'll be only one in town whose process bears famous Parents' seal. Business grows rapidly due to recommendations and repeat jobs. EASY TERMS. Send TODAY for fascinating FREE BOOKLET with complete details.

DURACLEAN CO.
7-184 Duraclean Building • Deerfield, Illinois

WHAT ALL AUTO MECHANICS WANT TO KNOW

1696 PAGES

This Big Practical Book gives full information with working diagrams covering the principles, construction, ignition, service and repair of modern cars, trucks and buses.

Diesel Engines, Hydramatic & Fluid Drives Fully Explained.

A complete Guide of 1696 Pages, with over 1500 illustrations showing inside views of working parts, with instructions for service jobs.

IT PAYS TO KNOW

How to fit pistons—How to locate engine knocks, How to fit connecting rod bearings—How to service main bearings—How to recondition valves—How to time valves—How to adjust fan belts—How to adjust carburetors and chokes, How to rebuild a clutch—How to service automatic transmissions—How to service brakes—How to adjust steering gear—How to cope with ignition troubles—How to service distributors—How to time ignition—How to "tune up" an engine.

$6 COMPLETE • PAY $2 A MO.
TO GET THIS ASSISTANCE FOR YOURSELF SIMPLY FILL IN AND MAIL COUPON TODAY.

Step up your own skill with the facts and figures of your trade. Audels Mechanics Guides contain Practical Inside Trade Information in a Handy Form. Fully illustrated and Easy to Understand. Highly Endorsed. Check the book you want for 7 DAYS FREE EXAMINATION. Send No Money. Nothing to pay postman.

MAIL ORDER

AUDEL, Publishers, 49 W. 23 St., NEW YORK 10, N. Y.

Please send me for FREE EXAMINATION books marked (x) below. If I decide to keep them I agree to mail $2 in 7 Days on each book or set ordered and further mail $2 monthly on each book or set until I have paid price plus shipping charges. Otherwise I will return them.

Check NOW!

You Can Look Over Any Guide In Your Own Home

☐ **SAVE SHIPPING CHARGES!** Enclose Full Payment With Coupon and We Pay Shipping Charges

- ☐ HOME APPLIANCE SERVICE GUIDE, 864 Pages $6
- ☐ AUTOMOBILE MECHANICS GUIDE, 1696 Pages 6
- ☐ TRUCK & TRACTOR GUIDE, 1376 Pages 5
- ☐ DIESEL ENGINE MANUAL, 640 Pages 3
- ☐ MACHINISTS HANDY BOOK, 1728 Pages 6
- ☐ WELDERS GUIDE, 608 Pages 3
- ☐ BLUE PRINT READING, 448 Pages 3
- ☐ MATHEMATICS & CALCULATIONS, 752 Pages 3
- ☐ SHEET METAL PATTERN LAYOUTS, 1152 Pgs. 7.50
- ☐ SHEET METAL WORKERS HANDY BOOK, 448 Pgs. 2
- ☐ MECHANICAL DRAWING GUIDE, 192 Pages 2
- ☐ MECHANICAL DRAWING & DESIGN, 480 Pages 3
- ☐ TELEVISION SERVICE MANUAL, 480 Pages 3
- ☐ RADIOMANS GUIDE, 1088 Pages 6
- ☐ ELECTRONIC DEVICES, 304 Pages 3
- ☐ ELECTRIC MOTOR GUIDE, 1056 Pages 5
- ☐ WIRING DIAGRAMS (Light & Power), 304 Pgs. 2
- ☐ ELECTRICIANS EXAMINATIONS, 272 Pages 2
- ☐ ELECTRIC POWER CALCULATIONS, 480 Pages 3
- ☐ HANDY BOOK OF ELECTRICITY, 1520 Pages 5
- ☐ ELECTRIC DICTIONARY, 9000 Terms 3
- ☐ ELECTRIC LIBRARY, 7000 Pages (10 Book Set) 20
- ☐ REFRIGERATION & Air Conditioning, 1360 Pgs. 6
- ☐ MILLWRIGHTS & MECHANICS GUIDE, 1248 Pgs. 5
- ☐ POWER PLANT ENG'NEERS GUIDE, 1568 Pages 5
- ☐ ENGINEERS & FIREARMS EXAMS, 544 Pages 2
- ☐ PUMPS, Hydraulic & Air Compressor, 1760 Pgs. 6
- ☐ OPERATING ENGINEERS LIBRARY (3 Books) 12
- ☐ GARDENERS & GROWERS GUIDES (4 Book Set) 6
- ☐ CARPENTERS & BUILDERS GUIDES (4 Book Set) 6
- ☐ PLUMBERS & Steamfitters Guides (4 Book Set) 6
- ☐ MASONS AND BUILDERS GUIDES (4 Book Set) 6
- ☐ PAINTERS & DECORATORS MANUAL, 464 Pgs. 2
- ☐ HOUSE HEATING GUIDE, 1008 Pages 5
- ☐ OIL BURNER GUIDE, 416 Pages 2

Name _____

Address _____

Occupation _____

Employed by _____ S-4

SAVE ½ ON ACCORDIONS • SAVE ½ ON ACCORDIONS

BUY DIRECT and SAVE UP TO ½ on ITALIAN ACCORDIONS EASY TERMS

AMAZING NO RISK OFFER... Now you can afford a world famous Accordion of finest tone and breathtaking beauty! Low wholesale prices save you half and more.

5 DAYS FREE TRIAL

ACT NOW! FREE—
- Music Stand
- Home Study Course
- Deluxe Case
- Lifetime Guarantee

COLOR CATALOG FREE Mail Coupon

MONEY BACK GUARANTEE

Buy direct from world's largest dealer. Save 50% or more. 30 newest models to choose from. Extra bonus gifts if you buy now. Satisfaction guaranteed or money back. Trade-ins accepted. Low down payment; pay little as $10.00 a month. Try before you buy on FIVE DAY TRIAL. Rush coupon now for FREE color catalog and wholesale price list. Write TODAY.

Accordion Manufacturers and Wholesalers Outlet, Dept. P-47
2003 W. Chicago Ave., Chicago 22, Ill.

Accordion Manufacturers & Wholesalers Outlet
2003 W. Chicago Ave., Dept. P-47, Chicago 22, Ill.
Send FREE Color Catalog and price list.
NAME_____
ADDRESS_____
CITY_____ STATE_____

HARLEY-DAVIDSON DEALER OPPORTUNITIES

A few excellent opportunities are available to sell and service the world-famous Harley-Davidson motorcycle for pleasure, police, and commercial work. If you are mechanically inclined, like outdoor activities, enjoy selling and are willing to work to build a successful business for yourself, we want to hear from you.

Tell us about yourself; your age, business background and how much money you have to start — motorcycle experience desirable but not essential. You'll receive a prompt reply telling you about our franchise, factory co-operation and our extensive national advertising support.

Write Department PS-1

HARLEY-DAVIDSON MOTOR CO.
MILWAUKEE 1, WISCONSIN

INVENTORS

PROTECT YOUR INVENTION BY A U. S. PATENT. SEND FOR FREE "INVENTION RECORD" FORM AND "PATENT INFORMATION EVERY INVENTOR SHOULD HAVE".

CARL MILLER
REGISTERED PATENT ATTORNEY
WOOLWORTH BLDG., 36th FLOOR, 47C
NEW YORK CITY

INVENTORS

I shall be pleased to furnish you, upon request, with information relative to patent procedure—without any obligation on your part.

PATRICK D. BEAVERS
Registered Patent Attorney
937 Columbian Building, Washington 1, D. C.

INVENTORS

Whether an invention is patentable can be substantially determined by a search of the U. S. Patent records. Without obligation, write for information explaining the steps you should take to secure a patent.

JOHN N. RANDOLPH
Registered Patent Attorney
205 Columbian Building Washington 1, D. C.

INVENTORS

U. S. Patents protect your inventions. Our free book of "Instructions on Patent Procedure for Inventors," also "Certificate of Invention" form sent without obligation.

C. A. SNOW & CO.
REGISTERED PATENT ATTORNEYS
426 SNOW BUILDING WASHINGTON 1, D. C.

INVENTORS

Send for PATENT INFORMATION Book and INVENTOR'S RECORD without obligation
GUSTAVE MILLER
47 PS WARNER BUILDING
WASHINGTON 4, D.C.

REGISTERED PATENT ATTORNEY
ASSOCIATE EXAMINER U.S. PAT. OFF. 1922-1929
Patent Attorney & Advisor U. S. NAVY DEPT. 1930-1947
PATENT LAWYER

TREMENDOUS Profits with Hagen's Exclusive TEAR GAS PENCIL!

100% PROTECTION

This Tear-Gas Pencil discharges smothering clouds of tear gas to instantly stop, stun and incapacitate the most vicious man or beast, an effective substitute for dangerous firearms; leaves no permanent injury. No selling experience needed. Handle as a profitable sideline . . . soon you'll sell it full time. Start now! Send $4.95 for complete demonstrating kit of Automatic Tear Gas Pencil, 10 demonstrators & 3 Powerful Tear Gas Cartridges. Not sold to minors.

SELLS EASY TO SERVICE STATIONS SMALL STORES LOAN OFFICES BANKS, HOMES

HAGEN SUPPLY CORP., Dept. P-47, St. Paul 4, Minn.

Rip Van Winkle Couldn't Sleep with Nagging Backache

Now! You can get the fast relief you need from nagging backache, headache and muscular aches and pains that often cause restless nights and miserable tired-out feelings. When these discomforts come on with over-exertion or stress and strain—you want relief—want it fast! Another disturbance may be mild bladder irritation following wrong food and drink—often setting up a restless uncomfortable feeling.

For quick relief get Doan's Pills. They work fast in 3 separate ways: 1. by speedy pain-relieving action to ease torment of nagging backache, headaches, muscular aches and pains. 2. by their soothing effect on bladder irritation. 3. by their mild diuretic action tending to increase output of the 15 miles of kidney tubes.

Find out how quickly this 3-way medicine goes to work. Enjoy a good night's sleep and the same happy relief millions have for over 60 years. Ask for new, large size and save money. Get Doan's Pills today!

MONEY for MEN ALL DATA FREE

THE PLASTEX Industry needs manufacturers on small scale and for big production of Lamp and Clock Stands, Art Goods and Novelties in Plastex and Marble imitation. Experience unnecessary. 1½c material makes regular 10c store sellers. Rubber moulds furnished for speed production. Small investment brings good returns. We are now placing big chain store orders with manufacturers. Ambitious men have chance for real prosperity. Our Free booklet will interest and benefit you.

PLASTEX INDUSTRIES, Dept. 2, 3400 Third Ave., New York 56, N.Y.

HYPNOTISM

Be Popular Amaze Entertain

Learn to apply Hypnotism and Autosuggestion in short time by training at home. Write to America's oldest, most famous Hypnotic School for free information—now—today. DON'T DELAY. Satisfaction or money refunded. Sent in plain wrapper.

SCHOOL OF APPLIED HYPNOLOGY

Dept. 24 120 Central Park South N. Y. 19, N. Y.

30 BOAT PLANS 50¢

Build the Boat of Your Dreams

Now you can build almost any type of boat—hydroplane racer, cabin cruiser, motor sailer, inboard runabout, all-purpose sloop, "hot-rod" speedster, boat trailer, sailing dinghy—plus 22 other boats from simple easy-to-follow plans. Includes complete bills of materials, scores of photos and step-by-step construction pictures. Send 50c for our "Boat Builder's Handbook". Satisfaction guaranteed.

SCIENCE & MECHANICS, 450 E. Ohio St., Dept. 994, Chicago 11, Ill.

Make More Money in

AUTO MECHANICS

Learn at home in spare time. Low tuition All-in-one Shop Method course covers Overhaul, Soup-up, Tune-up, Fuel Injection — ALL OTHER PHASES!! You get every thing you need for success in America's BIGGEST Industry. We also give you Motor Analyzing Set, Socket Wrench Set, and complete Tool Set. Write for Information. Send coupon TODAY for FREE BOOK & SAMPLE LESSON. **NATIONAL SCHOOLS**

GET STARTED NOW

National Schools Dept. DC-47
4000 So. Figueroa Los Angeles 37, Calif.
Send Free Auto-Diesel Opportunity Book Today.

Name _____ Age _____
Address _____
City _____ State _____

☐ Check if interested ONLY in Resident School Training at Los Angeles

Your choice of school is highly important to your career in

INDUSTRIAL ELECTRONICS

RADIO-TELEVISION

ELECTRONICS COMMUNICATIONS

Become an
ELECTRICAL ENGINEER
or an
ENGINEERING TECHNICIAN
at

MSOE *in Milwaukee*

Choose from courses in:

ELECTRICAL ENGINEERING
Bachelor of Science degree in 36 months.
Communications or Electrical Power option.

ENGINEERING TECHNICIAN
Assoc. in Applied Science degree — in 18 months.
Electronics Communications
Electrical Power.

MSOE — located in Milwaukee, one of America's largest industrial centers — is a national leader in electronics instruction — with complete facilities, including the latest laboratory equipment, visual aid theater, amateur radio transmitter — offers 93 subjects in electrical engineering, electronics, radio, television, electrical power, and electricity.

Advisory committee of leading industrialists. Courses approved for veterans. Over 50,000 former students. Excellent placement record.

Previous educational, practical, and military experience evaluated for advanced credit.

TERMS OPEN JANUARY, APRIL, JULY, SEPTEMBER

Write today! Choose wisely—your future depends on it.

MILWAUKEE
SCHOOL OF ENGINEERING
Dept. PS 457, 1025 N. Milwaukee St.
Milwaukee 1, Wisconsin

Send FREE career booklets. *(Please print)*

I am interested in _____
(Name of course)

Name _____ Age _____
Address _____
City _____ Zone _____ State _____

Eligible for veteran's educational benefits? Yes ..... No .....

MS-57A

What Do 3 Out of 4 Doctors Recommend to Relieve Pain?

A survey shows 3 out of 4 doctors recommend the famous ingredients of Anacin Tablets to relieve pain of headache, neuritis and neuralgia. Here's why Anacin® gives you better *total* effect in relieving pain than aspirin or any buffered aspirin:

- **ACTS INSTANTLY:** Anacin goes to work *instantly*. Brings fast relief to *source* of your pain.
- **MORE EFFECTIVE:** Anacin is like a doctor's prescription. That is, Anacin contains not one but a combination of effective, medically proven ingredients.
- **SAFER:** Anacin simply *can not* upset your stomach.
- **LESSENS TENSION:** Anacin also reduces nervous tension, leaves you relaxed, feeling fine after pain goes. Buy Anacin *today*.

Shrinks Hemorrhoids New Way Without Surgery

Science Finds Healing Substance That Relieves Pain—Shrinks Hemorrhoids

For the first time science has found a new healing substance with the astonishing ability to shrink hemmorhoids and to relieve pain—without surgery.

In case after case, while gently relieving pain, actual reduction (shrinkage) took place.

Most amazing of all—results were so thorough that sufferers made astonishing statements like "Piles have ceased to be a problem!"

The secret is a new healing substance (Bio-Dyne*) —discovery of a world-famous research institute.

This substance is now available in *suppository* or *ointment form* under the name *Preparation H.** Ask for it at all drug counters—money back guarantee.

*Reg. U.S. Pat. Off.

Stop Pushing Doorbells!
SELL MASTER UNIFORMS TO BUSINESS MEN
—and make up to $50 in a day!

Say "goodbye" to tiresome, unprofitable house-to-house canvassing! Sell in **volume** to business men and pocket **volume profits fast!** Customers buy from 1 to 100 uniforms for employees all at one time! You make big money **on the spot!** You'll cash in big, because your line of attractive, well-made Master **advertising uniforms** builds company pride and prestige. Company name or trademark is embroidered right on uniforms —employees become "walking advertisements" of tremendous value to the firm. That's why your prospects buy **fast . . . in volume** . . . again and again! Your profits zoom to new heights in a hurry! And you never invest one cent. We carry the stock; we ship and collect. All you do is show the line and take **Big Profit** orders! Rush coupon now to get—FREE—your powerful Sample Outfit that has everything you need to start making big money right away!

GEO. MASTER GARMENT CO., Dept. A-22
Ligonier, Indiana

You bet I want to make up to $50 in a day selling Master Advertising Uniforms to business men! Rush my FREE profit-packed Sample Outfit right away!

NAME _____

ADDRESS _____

TOWN _____ STATE _____

HOW TO TURN *Concrete* INTO *Gold*

A MUST FOR EVERYONE CONCERNED!

This MANUAL Tells You How To Make Handsome Profits From Concrete Items YOU CAN MAKE

All you need is a mold or two and a little determination. This Manual contains large, clear pictures, gives prices and description of more than 200 different molds you can buy direct from the manufacturer, AND . . . priceless trade secrets that make production a snap. Take the first step Today !!!

SEND ONLY $2.00 FOR YOUR COPY
(Rushed to you by First Class Mail)

CONCRETE MACHINERY COMPANY, INC.
Dept PS Hickory, N. C.

Mr. "N" Made $9,700 Last Year by Selling Just 20 KEEP/SAFES a Month

Like Mr. "N" you can profit with KEEP/SAFE—the fine personal safe that undersells all others. Only safe sold direct. 95% of homes, farms and small businesses are prospects. $30 to $71 profit per sale, **plus** bonuses up to $12 a safe. Choice territory, chance to become district agent. **FREE DEMONSTRATOR!** Get details, giving address, including county.

JOHN D. BRUSH & CO., INC.
577 West Ave., Rochester 11, N. Y.

Secrets of VENTRILOQUISM *Now Revealed!*

Easy to learn in 60 to 90 days with our Home Study Course. **RESULTS GUARANTEED. Make Money! Be Popular! Have Fun! Big Opportunity! Radio, Television, Stage Appearances! For Free** Information regarding price and terms, WRITE. You must state your age. Dummy Catalog 25c.

MAHER HOME COURSE OF VENTRILOQUISM
Box 36, Studio PS-4, Kensington Station
Detroit 24, Michigan

MEN WANTED

Earn $100 Per Week and up

AUTO DIESEL MECHANICS

Master a trade with a future—learn Auto-Diesel mechanics in our shops. You learn with tools on real equipment. Earn while you learn. Many of our graduates earn $100 per week and up. No previous experience necessary. Day and night courses. Approved for veterans. Write for free bulletin.

NASHVILLE AUTO-DIESEL COLLEGE
226 7th Ave., N., Dept. 41 Nashville 3, Tenn.

Genuine Dupont Plastic NEW FALSE PLATE

From Your Old, Loose Plate NO IMPRESSIONS NEEDED

New, revolutionary Duplication System actually transforms your old, loose, cracked, chipped plate into a new, natural-pink Dupont Plastic Plate with same teeth or new, natural matched teeth. ONE DAY SERVICE!

Only $18.95

30-DAY MONEY-BACK TRIAL

SEND NO MONEY—just your **name and address** for *FREE* details. *Save at our low price!* **Highest prices paid for** Dental Gold. **ALL-STATE DENTAL LABORATORIES, 22 W. Madison, Dept. 70, Chicago 2.**

Acclaimed by the West

AUTOBIOGRAPHY of a YOGI

By Paramhansa Yogananda

"These pages reveal, with incomparable strength and clarity, a fascinating life, a personality of unheard-of greatness . . . The author undertakes the unique task of instructing the Western reader in the practical applications of yoga, setting the example in his own life . . . In these pages is undeniable proof that only the mental and spiritual striving of man has lasting value, and that he can conquer all material obstacles by inward strength . . . We must credit this important **Autobiography** with the power to bring about a spiritual revolution."
— Schleswig-Holsteinische Tagepost, daily newspaper of Germany.

At your bookstore $4.00

HOW WOULD YOU LIKE TO BREAK INTO ENGINEERING STARTING NEXT MONTH?

Your start in Engineering could mean higher pay, more interesting work, a real chance for advancement. Here's how to do it—fast!

A career in Engineering may be closer than you think, whatever your age or education or present job.

You know about the tremendous demand for engineers and technicians. But do you know how easy it is to get the training that will qualify you for this vital work, and how quickly you can advance?

First Step Wins Job Consideration

The moment you enroll for a course in Engineering you're in a position to change your job. I.C.S. Engineering Courses, for example, start you off with Basic Mathematics and Drafting. Most employers are quick to accept men who start technical training.

Your Advancement Is Rapid

Your interest, your determination, your willingness to spend free hours improving yourself all work in your favor. But your mastery of engineering subjects is what wins you the biggest boosts.

The I. C. S. method makes it possible for you to learn while you earn, to qualify yourself for upgrading step by step—from Draftsman to Detail Designer to Engineering Technician to full-fledged Engineer. It's a plan fitted to your needs, with personalized instruction and guidance, and, if you like, regular progress reports to your employer.

Mail Coupon for Free Books

If you are seriously interested in a fresh start in an opportunity-packed field, then mark and mail the coupon today. We'll send you *three* free books—(1) the 36-page career guide "How to Succeed," (2) Opportunity outlooks in your field of interest, (3) sample lesson (Math) demonstrating I. C. S. method.

For Real Job Security—Get an I. C. S. Diploma! **I. C. S., Scranton 9, Penna.** **Member, National Home Study Council**

INTERNATIONAL CORRESPONDENCE SCHOOLS

ICS

BOX 14968D, SCRANTON 9, PENNA. (Partial list of 257 courses)

Without cost or obligation, send me "HOW to SUCCEED" and the opportunity booklet about the field BEFORE which I have marked X (plus sample lesson):

ARCHITECTURE and BUILDING CONSTRUCTION
- ☐ Air Conditioning—Refrig.
- ☐ Architecture
- ☐ Architectural Interiors
- ☐ Building Contractor
- ☐ Building Estimator
- ☐ Building Maintenance
- ☐ Carpentry and Mill Work
- ☐ Heating
- ☐ Painting Contractor
- ☐ Plumbing
- ☐ Reading Arch. Blueprints

ART
- ☐ Cartooning
- ☐ Commercial Art
- ☐ Fashion Illustrating
- ☐ Magazine Illustrating
- ☐ Show Card and Sign Lettering
- ☐ Sketching and Painting

AUTOMOTIVE
- ☐ Auto Body Rebuilding
- ☐ Auto Elec. Technician
- ☐ Auto-Engine Tune Up
- ☐ Automobile Mechanic

AVIATION
- ☐ Aeronautical Engineering Jr.
- ☐ Aircraft & Engine Mechanic

BUSINESS
- ☐ Advertising
- ☐ Bookkeeping and Accounting
- ☐ Business Administration
- ☐ Business Correspondence
- ☐ Public Accounting
- ☐ Creative Salesmanship
- ☐ Federal Tax
- ☐ Letter-writing Improvement
- ☐ Office Management
- ☐ Professional Secretary
- ☐ Retail Business Management
- ☐ Sales Management
- ☐ Stenographic-Secretarial
- ☐ Traffic Management

CHEMISTRY
- ☐ Analytical Chemistry
- ☐ Chemical Engineering
- ☐ Chem. Lab. Technician
- ☐ General Chemistry
- ☐ Natural Gas Prod. & Trans.
- ☐ Petroleum Engineering
- ☐ Plastics
- ☐ Pulp and Paper Making

CIVIL, STRUCTURAL ENGINEERING
- ☐ Civil Engineering
- ☐ Construction Engineering
- ☐ Highway Engineering
- ☐ Reading Struct. Blueprints
- ☐ Sanitary Engineering
- ☐ Structural Engineering
- ☐ Surveying and Mapping

DRAFTING
- ☐ Aircraft Drafting
- ☐ Architectural Drafting
- ☐ Electrical Drafting
- ☐ Mechanical Drafting
- ☐ Mine Surveying and Mapping
- ☐ Plumbing Drawing and Estimating
- ☐ Structural Drafting

ELECTRICAL
- ☐ Electrical Engineering
- ☐ Electrical Maintenance
- ☐ Electrician ☐ Contracting
- ☐ Lineman

HIGH SCHOOL
- ☐ Commercial ☐ Good English
- ☐ High School Subjects
- ☐ Mathematics

LEADERSHIP
- ☐ Foremanship
- ☐ Industrial Supervision
- ☐ Leadership and Organization
- ☐ Personnel-Labor Relations

MECHANICAL AND SHOP
- ☐ Gas—Electric Welding
- ☐ Heat Treatment ☐ Metallurgy
- ☐ Industrial Engineering
- ☐ Industrial Instrumentation
- ☐ Industrial Supervision
- ☐ Internal Combustion Engines
- ☐ Machine Design-Drafting
- ☐ Machine Shop Inspection
- ☐ Machine Shop Practice
- ☐ Mechanical Engineering
- ☐ Quality Control
- ☐ Reading Shop Blueprints
- ☐ Refrigeration
- ☐ Sheet Metal Worker
- ☐ Tool Design ☐ Toolmaking

RADIO, TELEVISION
- ☐ Industrial Electronics
- ☐ Practical Radio TV Eng'r'ng
- ☐ Radio and TV Servicing
- ☐ Radio Operating
- ☐ Television Technician

RAILROAD
- ☐ Air Brake Equipment
- ☐ Car Inspector
- ☐ Diesel Engineer & Fireman
- ☐ Section Foreman

STEAM AND DIESEL POWER
- ☐ Combustion Engineering
- ☐ Diesel—Elec. ☐ Diesel Eng's
- ☐ Electric Light and Power
- ☐ Stationary Fireman
- ☐ Stationary Steam Engineering

TEXTILE
- ☐ Carding and Spinning
- ☐ Cotton, Rayon, Woolen Mfg.
- ☐ Finishing and Dyeing
- ☐ Loom Fixi'g ☐ Textile Des'ing
- ☐ Textile Eng'r'g ☐ Throwing
- ☐ Warping and Weaving

MISCELLANEOUS
- ☐ Domestic Refrigeration
- ☐ Marine Engineering
- ☐ Ocean Navigation
- ☐ Professional Engineering
- ☐ Short Story Writing
- ☐ Telephony

Name _____ Age _____ Home Address _____

City _____ Zone _____ State _____ Working Hours _____ A.M. to P.M. _____

Occupation _____

Canadian residents send coupon to International Correspondence Schools, Canadian, Ltd., Montreal, Canada. . . . Special tuition rates to members of the U. S. Armed Forces.

She Helped a Burglar make his Getaway

WAKING ONE MIDNIGHT, she surprised a burglar in her room. As he leapt for the window, she stopped him. "You'll be hurt. Go down by the stairs and let yourself out."

Calm, kind, and acutely intelligent, she had long ago learned to stay human in emergencies—by living where emergencies were routine, in the heart of one of Chicago's poorest immigrant neighborhoods.

Here she had settled down to her life work—helping people. No sociologist or social worker, she left it for others to make this a science. To her, it was an art. An art she practiced so beautifully that, eventually, while she was loved around Halsted Street, she was admired around the world.

When, in 1935, Jane Addams of Hull House died, her little grandniece, seeing hundreds of children among the mourners, asked, "Are we all Aunt Jane's children?"

In a sense, we all are. For the work Jane Addams did and the lessons she taught still help us all. And they prove magnificently the fact that America's greatest wealth lies in Americans.

It is the character and abilities of her people that make this country strong. And it is these selfsame people who make our nation's Savings Bonds one of the world's finest investments. For in U.S. Savings Bonds your principal is guaranteed safe to any amount—and your interest guaranteed sure—by the government that represents the united strength of 168 million Americans. So for your family's security, buy Savings Bonds. Buy them at your bank or through the Payroll Savings Plan at work. And hold on to them.

PART OF EVERY AMERICAN'S SAVINGS BELONGS IN U.S. SAVINGS BONDS

The U.S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.

READ THESE FACTS BEFORE YOU ORDER YOUR ZOYSIA GRASS

CHOKES OUT WEEDS, CRABGRASS, OLD GRASS
• ⅔ Less Mowing • Laughs At Water Shortage

U.S. DEPT. OF AGRICULTURE PERFECTS WORLD'S MOST PERFECT GRASS APPROVED BY U.S. GOLF ASSN.

Stays Green Even Through Drought— When ordinary grasses burn brown!

Just plug it in, watch it spread into thick beautiful lawn!

1. **NO WASTE, NO SOD TO CUT, NO SEED FAILURE.** Arrives in fresh, green plugs of living grass that assures fast, sure growth.

2. **Just set pre-cut plugs** into holes in ground one foot apart, checkerboard style. (Easy planting instructions with each order.)

3. **Each soil-enriched** plug takes root and spreads into thick, beautiful turf.

4. **Amazing root system** grows so deep (2-3 feet down) your lawn retains its own supply of underground water. No more ugly brown or bare spots —EVER!

Each Amazoy plug spreads to cover planted area solidly. You can then take 50 transplants yearly—transplant even in midsummer heat! Sell them, use them yourself—an endless supply every year!

FREE! EXCLUSIVE STEP-ON PLUGGER

For Planting and transplanting. Patented design cuts away competing growth as it digs hole for plugs, for faster, surer growth. Order at $4.95 or FREE with larger order.

Dept. 420
ZOYSIA FARMS
602 N. Howard St.
Baltimore 1, Md.
333 N. Michigan Ave.,
Chicago 11, Ill.

GUARANTEED To Grow In Any Soil. Any Plug Failing To Grow Replaced FREE.

There is only one original AMAZOY "Plug-In" Grass (not sold in seed, sod, sprigs, etc.) More than 100,000 satisfied customers have made us the world's largest growers-producers of the finest quality Zoysia Grass in existence. Avoid risk of lost labor and disappointment—avoid more seed expense every year. Order AMAZOY by mail direct from Nursery Farm TODAY!

Praised by LOOK, NEWSWEEK, HARPERS, POPULAR GARDENING, ARTHUR GODFREY, ETC. No other grass ever won such praise!

Order Now From World's Largest Growers. And Save! New Low Prices!	
100 Pre-Cut Plugs & Plugger	**$9.98**
100 Large Pre-Cut Plugs & Plugger	**$11.98**
300 Large Pre-Cut Plugs & Plugger	**$24.98**
600 Pre-Cut Plugs & Plugger	**$44.98**

- **Never Needs Re-seeding**
- **Takes Playground punishment**
- **More Beauty Yet COSTS YOU LESS**

Genuine Amazoy is the revolutionary lawn grass that produces a weed-free, carefree lawn. Perfected and released by U.S. Dept. of Agriculture and approved by U.S. Golf Assn. So deep rooted it goes weeks and stays beautiful without watering, whether due to water bans or because you are away. Needs ⅔ less mowing. Costs you less because plugs spread above and below ground into even, deep-green turf that practically eliminates upkeep. So thick and rich, insects, fungus, diseases can't live in it. Never needs re-seeding. Won't winter kill. Has survived winters of 30° below zero. Cuts fertilizer costs; ends need for weed killers. Drives out weeds, dandelions, crabgrass and old grass permanently. Planted in U.S. Air Bases, Post Office Grounds, Golf Courses, and tens of thousands of lawns. When other lawns burn out or turn patchy brown and ugly, your Amazoy lawn remains lush, green, lovely—the pride of your neighborhood.

ORDER NOW — CLIP COUPON

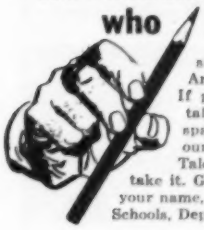
To: Dept. 420, ZOYSIA FARM NURSERIES
602 N. Howard St., Balto. 1, Md.
333 N. Michigan Ave., Chicago 1, Illinois
Please ship the following order of Amazoy Meyer Z-52

☐ **100 PLUGS $9.98** ☐ **100 PLUGS AND PLUGGER $11.98** ☐ **300 PLUGS AND PLUGGER $24.98**
☐ **FULL SIZE PLUGGER $4.95** ☐ **600 PLUGS AND PLUGGER $44.98**

If you live West of Miss. River, please add $1.50 per 100 plugs for special handling and shipping. (We pay postage E. of Miss. R.) Sorry no COD's. I enclose
.....check .....money order .....cash
Name.....
Address.....
City.....Zone.....State.....

When Writing to Advertisers Please Mention Popular Science

"We're looking for people who like to draw..."



says Norman Rockwell, one of America's 12 Most Famous Artists. If *you* like to draw, you may have talent to become a successful artist, spare or full time. Find out with our remarkable 12-page Free Art Talent Test. Thousands paid $1 to take it. Get it FREE. No obligation. Send your name, address, age to: Famous Artists Schools, Dept. 154, Westport, Conn.

Home Operators Take Over Huge Rubber Stamp Profits

Men and Women Everywhere Now Can Start in a Big-Pay Business at Home in Spare Time

The multi-million dollar Rubber Stamp business is now being taken over by small, home operators throughout the U.S. Men and Women who operate this inexpensive machine can turn out large numbers of Rubber Stamps with special wording of all kinds. Material costing only 27c makes a stamp that sells for $1.80. The machine is easy for anyone to operate. It molds as many as six Rubber Stamps at a time, each with different wording such as names, addresses, notices, stock numbers, prices and other "copy" needed by offices, factories and individuals. At full capacity, it can earn as much as **$9.20 an hour for the operator!** You don't need experience to get into this big profit business at home. We supply everything, including complete instructions and eight ways to get orders for stamps coming in fast. Start making up to $9.20 in one hour right away. We'll mail full particulars FREE and no salesman will call. Be first in your locality. Rush coupon today to **Rubber Stamp Div., 1512 Jarvis Ave., Dept. R-3-D, Chicago 26, Ill.**

This Little Table Top Machine pays Home Workers up to $9.20 AN HOUR.

Rubber Stamp Div., Dept. R-3-D
1512 Jarvis, Chicago 26, Ill. ***FREE!***
Please rush full particulars about the little machine that can get me started in the profitable Rubber Stamp business at home in spare time. Everything you send me is FREE and no salesman will call.

Name .....
Address .....
City.....*Zone*.....*State*.....

DRAFTSMEN

CASH BIG PAY CHECKS!

Train Now for more success, greater security

LEARN AT HOME IN SPARE TIME
(or at college in Chicago)

Check the want ads in any newspaper—SEE the big-pay opportunities open to you as a draftsman. What's more, you can learn this well-paid, prestige profession at home—quickly, easily! No special talent needed. Get complete, step-by-step Chicago Tech lessons in the mail, spend a few pleasant hours studying each week. In a short time you'll be a well-trained draftsman, ready to take your pick of many good jobs. Act now!

FREE INFORMATION—MAIL COUPON TODAY!
Get FREE TRIAL LESSON plus information about C.T.C. practical training. Learn what successful Chicago Tech graduates say about high pay and opportunities in drafting. No charge, or obligation.

CHICAGO TECHNICAL COLLEGE

D-225 Tech Bldg., 2000 So. Michigan Ave.
Chicago 16, Illinois
Mail me FREE Lesson with information about big opportunities in DRAFTING.

Name.....Age.....

Address.....

City.....Zone....State.....

LEARN UPHOLSTERY
in your spare time
run your own business AT HOME

BE YOUR OWN BOSS

Earn more from the start while learning AT HOME Set up your own profitable business at home, enjoy steady income, independence—in the booming field of Custom Furniture Upholstery.

Right off you start with tools, complete frames, fabrics, materials, included FREE with your UTS course. You earn as you learn skilled professional custom upholstery, reupholstery, furniture finishing, repairs; to make slip covers, window cornices, cushions, draperies in your spare time . . . the UTS easy way.

Send for FREE Illustrated Book, Sample Lesson
Get ready for well-paid job, steady work and big profits as your own boss. Write today. No obligation. Also Training in N.Y. School. APPROVED FOR VETERANS TRAINING.

UPHOLSTERY TRADES SCHOOL
Dept. FD-1610, 721 B'way, N. Y. 3, N. Y.

GROW ORCHIDS AT HOME

BIG PROFITS SPARE OR FULL TIME

World's most thrilling hobby – profitable home business.

Year 'Round Maine to Calif. No Greenhouse

Successful home grower shows you how to start—how to provide proper temperature & air conditions in any well lighted room—how to market Orchid flowers and plants for fine profits to friends, neighbors, hotels, florists. Also **MAIL ORDER** from big city, small town, or farm. **FILL YOUR HOME WITH NATURE'S MOST FABULOUS FLOWER.** Many grow without soil, getting food from the air. Purple, white, yellow, green, every rainbow color. Illustrated instructions include blooming-size Orchid plant—Everything you need to start. Hundreds of home growers Coast to Coast using our plan successfully. Send name & address on postcard for real **ORCHID SEEDS** & full details, including "Quick-Profit" plan all **FREE. TROPICAL FLOWERLAND,** Dept. 24, 100 So. Vermont, Los Angeles 4, Calif.

75 POWER TELESCOPE $3.98

VARIABLE EYEPIECE 25X-45X-75X—BRASS BOUND

NEW! Three telescopes in one. 3 different magnifications. 25 power for ultra-bright images with 45 and 75 power for extra long range. Guaranteed to bring distant objects, people, sports events, ships, moon, stars, etc., 75 times as close.

Most powerful for anywhere near the money. 5 sections. Closes to 1 ft. long. Contains 4 ground and polished lenses. Also used as a powerful compound microscope. Directions included. Mass production enables us to offer this instrument at amazing price of $3.98 complete. Money back guarantee. We pay postage. Get yours now.

CRITERION CO., 331 Church St., Hartford, Conn., Dept. PSB46

FIND HIDDEN RICHES!

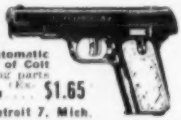
Find buried treasure, gold, silver, etc. with amazing 3½ lb. locator—GOLDAK'S "FIND-IT" . . . $64.50 complete with earphones, batteries, instructions.

Manufacturers of metal detection devices since 1933.

Write for FREE literature full line (1) metal or mineral locators, (2) geiger and scintillation counters, (3) underwater metal detectors.

GOLDAK CO. 1544-4 Glenoaks Blvd., Glendale, Calif.

10-Shot Pellet Gun



Shoots 10 pellets as fast as you pull trigger. For indoor target work & fun. **Automatic action.** Holds 10 pellets. **Full size model of Colt .45,** 6½-in. long. Plastic moulded. Moving parts of die cast metal. With supply of pellets. (Extra Pellets, 25c Pkg. Holster 50c) **EACH** ... **$1.65**

Johnson Smith & Company, Dept. 548, Detroit 7, Mich.

Catalog of 3200 Novelties 10c

Send 10c for amazing catalog of novelties, live animals, scientific supplies, hobbies, funmakers, planes & boats, looms, magic tricks, joke articles, unusual seeds, gadget timesavers, cameras, optical goods, projectors, movies, lucky jewelry, religious novelties, disguises, musical instruments, stamps, coins, puzzles, fortune tellers, radios, auto & bike accessories, telescopes, magnifiers, compasses, banks, smokers' gadgets, artists' supplies, printing sets, engines, motors, shockers, knives, billfolds, fireworks, guns, rifles, sports, books, games, plants, etc. Send name, address & 10c to:

JOHNSON SMITH & CO., Dept. 548 Detroit 7, Michigan

RUPTURE

RELIEF...OR YOUR MONEY BACK
Write now for free booklet and pictures of rupture care. You can be helped...work steady, with low cost, easy to wear Web Truss, thousands satisfied.

WEB TRUSS CO. Dept. PS-4, Hagerstown, Maryland

Free! ISRAEL Stamp Collection

Usually selling for $1.00 and more, this packet of **25 ALL DIFFERENT ISRAEL** stamps is yours FREE! Your chance to own a good basic collection including the various ancient **HEBREW COIN SETS, 12 TRIBES ISSUE, HIGH HOLY DAYS, RUNNING STAG ISSUE, AIRPOST, and CHILDREN'S ISSUE, etc. EXTRA: 48 PAGE STAMP DICTIONARY & GUIDE** included Free. Send 10 cents to help cover mailing costs.

STAMPEX COMPANY, Box 47-MP, White Plains, New York

SAVE HUNDREDS OF DOLLARS with HOME-A-MINUTE "KIT"

This is not something to feel around with.

A Hard Hitting System of Saving Big Money

Design and build your New Home, Attic Flat, Extra Bedrooms or Remodeling—IN MINUTES—with dozens of fiber partitions. Doors, Windows, Kitchen Cabinets, made to 1/4 inch scale same as blueprint. THEN, BELIEVE IT OR NOT, YOU, THE LAYMAN, who knows nothing about building, can estimate your own costs—IN MINUTES—after you adjust charts to local prices.

Don't build anything until you get this "KIT" if you want to save money. Handbook tells you how. This information should not pass you by. Complete "KIT" $3.95 ppd., if COD plus postage and $1 deposit required. Handbook without "KIT" $1.95 or free literature. Money back guarantee. Return in 10 days.

SPECIAL NOTICE!—As a builder, controlling over 3 million dollars worth of home construction, we will ATTEMPT, but not promise, to obtain a special discount to you for your building materials on your new project, thru your favorite, local, Lumber Dealer. Details with "KIT."

H. S. HALL & CO. 2825 N. 69th St. MILWAUKEE 10, WIS.

MAKE MONEY AS A LOCKSMITH

A RESPECTED, PROFITABLE TRADE FULL OR PART TIME. AGE OR HANDICAP IS NO RESTRICTION. UNCROWDED FIELD. EASY TO LEARN!

Licensed by N. J. State Board of Education. Approved by V.A.

LEARN AT HOME FROM LICENSED SCHOOL. EVERYTHING SUPPLIED BY US.

Send For FREE BOOKLET NOW!

LOCKSMITHING INSTITUTE, Dept. PS88
15 PARK AVENUE, RUTHERFORD, NEW JERSEY

Drive with Confidence

DINSMORE *Auto Compasses*

Shows you the right way—the short cuts. Saves time, money. Write for new compass history folder, "Pants—Knives—Compasses," and name of nearest dealer.

ONLY COMPASS APPROVED BY AUTO MAKERS

DINSMORE INSTRUMENT CO., 1814-27 Kelso St. FLINT 1, MICH.

TASOPE PHOTO-ENGRAVING PLANTS

MATERIAL COST OF THIS CUT 1/4c SELLING PRICE $1.00 AND UP

Establish your own profitable PHOTO-ENGRAVING business. Make cuts for newspapers, printers, and advertisers. Make etched name plates, plaques etc. Instructions furnished, no experience necessary. Sold direct from factory since 1931. First five hundred cuts sold locally or by mail will pay for plant and pay you well for your time. Write for FREE catalog.

TASOPE, DEPT. PS-4, AURORA, MO.

make it with 60c worth of sand & cement SELL IT FOR $20.00

every home a prospect for these patented "LIFETIME"

CONCRETE INCINERATORS

Make big profits manufacturing rust proof, fire proof, almost indestructible concrete incinerators in your own backyard or garage . . . full or part time. Sell to home-owners, hardware, department and garden supply stores. Philo. manufacturer doing big volume with Sears, Roebuck; large department stores. Easy to follow instructions and all needed equipment supplied. Exclusive protected franchise—No competition! Territories going fast. Write immediately for full details.

Dept. PS47, T. C. TOR, 2113 Bellevue St., Phila. 40, Pa.

DIESEL

MECHANICS IN DEMAND

Learn to earn big pay in DIESEL in our large, modern equipped Chicago school and shop. No previous experience or training necessary. We help you find living quarters and part time job while in school. Complete, practical courses taught in the following trades, under the supervision of experienced, expert technicians.

APPROVED FOR CIVILIANS ☐ OR GI'S ☐

—CHOOSE YOUR TRADE—

CHECK HERE	WEEKS
☐ DIESEL MECHANICS	20
☐ AUTO MECHANICS	20
☐ BODY & FENDER	16 2/3
☐ GAS-ARC WELDING	4-12
☐ REFRIGERATION	13 1/2
☐ AIR CONDITIONING	8 1/3
☐ MACHINIST TRADE	30
☐ ADVANCED MACHINIST (includes tool & die)	32 1/2
☐ PIANO TUNING & REPAIR	36

HEAVY CONSTRUCTION EQUIPMENT OPERATORS TRAINING SCHOOL—Road Building, Terracing, Land Clearing, etc. Reservations for starting classes now being accepted.

CHOOSE YOUR ENGINEERING COURSE

These courses are intended as terminal education for men who wish to enter the Diesel-Automotive and Refrigeration-Air Conditioning fields as technicians. These courses are designed to prepare men for supervisory positions. Students with a high school education, or equivalent, will be accepted.

☐ DIESEL AUTOMOTIVE ENGINEERING ..... 2 years
☐ REFRIGERATION & AIR COND. ENGINEERING ..... 18 months

FREE EMPLOYMENT HELP

Start your career with Greer by checking your interest above and mail coupon for complete information at no obligation.

NAME _____ AGE _____

STREET _____

TOWN _____ ZONE _____ STATE _____

Established 1902—Over 80,000 Graduates
54 years of continuous trade school experience to guide your training.

GREER SHOP TRAINING

Box D, 2238 S. Michigan Ave.
Chicago 16, Illinois

GOVERNMENT SURPLUS BELOW MFR'S COST

DUPONT NYLON CORDS

Light, strong, durable, quick-drying. Will not rot or mildew. Ideal for indoor or outdoor use. Camping, boating, hunting, clothesline and Venetian blinds. Perfect for tent ropes, light anchors, deer cord, trout lines, crabbing, etc. Unused.

OUTWEARS ORDINARY ROPE 10 TO 1

NYLON BRAIDED CORD

1/16" dia., 100 lb. test, white, per ft. ..... 1½¢
1/8" dia., 375 lb. test, white, per ft. ..... 2¢
3/16" dia., 550 lb. test, olive drab, per ft. ..... 2½¢
In 50, 100, 200, 300, 400, 500 ft. & over lengths

NYLON BRAIDED LINE

1/4" dia., 1000 lb. test olive drab, per ft. in 30, 50 & 100 ft. lengths ..... 3¢

NYLON FISHLINE

Proven best by experienced fishermen. Heat stretched. Will not kink, twist or unravel. 25 lb. test, 300 ft. Reg. $1 per spool ..... NOW 50¢

NYLON ROPE

1/4" dia., 1200 lb. test, per foot ..... 8¢
5/16" dia., 1900 lb. test, per foot ..... 12¢
3/8" dia., 2700 lb. test, per foot ..... 17¢
7/16" dia., 3800 lb. test, per foot ..... 20¢
1/2" dia., 4700 lb. test, per foot ..... 28¢
5/8" dia., 7300 lb. test, per foot ..... 45¢
3/4" dia., 10,000 lb. test, per foot ..... 60¢
All in any length up to 1200 feet.

NYLON WEB STRAPS with sturdy steel buckle

Perfect for passenger safety belts, luggage straps, car towlines, car carrying straps, boat trailer straps, etc. Tie heavy equipment and machinery with greater ease and safety . . . at far less cost. Just the thing for the garage or workshop.

1" wide, 3000 lb. test, per foot ..... 10¢
1¾" wide, 6000 lb. test, per foot ..... 16¢
In 5, 6, 8, 10, 12 foot lengths

SCREW EXTRACTOR SET
5 Pc. Chrome Vanadium

$1.98 ppd. Removes broken screws fast, easy. Each piece specially hardened, beautifully machined chrome vanadium steel. Comes in varnished hardwood case with sliding cover. You get sizes 1-5 screw extractors that remove 1/8" to 3/8" screws.

K & E LEVEL-SQUARE TAPE

$1.98 ppd. Famous K & E tape, used by mechanics for years, now has these EXTRAS! Built in, accurate, unbreakable level, and square! Wyteface tape is full 10 ft., replaceable! Sliding end hook makes inside, outside measurements accurate.

Minimum order $1.00. Send Check or M.O. C.O.D. plus fee. Money Back Guarantee

SCOTT-MITCHELL HOUSE, INC.
Dept. 1504, 611 Broadway, New York 12, N. Y.

TELEPHONES, TELEPHONE PARTS and WIRE & CONSTRUCTION SUPPLIES

BATTERY OPERATED TELEPHONES for Inter-House, House to Barn or Office to Shipping Room telephone service. Handset style or Desk Stand style.

MAGNETO TELEPHONES for Rural telephone lines, construction jobs, factories, farms, camps or summer homes, etc.

MOTEL TELEPHONE SYSTEM—Simple economical telephone service between office and each cabin. Suitable for roadside Drive-In food service, etc.

ANTIQUE TELEPHONE CABINETS—complete with all parts except generator. Ideal for Home Hobby Shops. Make beautiful Radios, Spice Cabinets, Liquor Chests and Flower Boxes.

TELEPHONE LAMPS. Make your own. Beautiful. Different. We furnish the parts or a complete Lamp, if you prefer.

WORM HARVESTER—Dan Mac Magneto—gathers fishworms by electricity.

WRITE FOR ILLUSTRATED BULLETIN "AA-22" which gives full facts on all of the above.

TELEPHONE REPAIR & SUPPLY CO.

Dept. AA-22, 1760 Lunt Ave. Chicago 26, Ill.

"America's Largest Independent Telephone Repair Shop"

EAT ANYTHING WITH FALSE TEETH

If you have trouble with plates that slip, rock and cause sore gums—try Brimms Plasti-Liner. One application makes plates fit *snugly without powder or paste*, because Brimms Plasti-Liner hardens permanently to your plate. It relines and refits loose plates in a way no powder or paste can do. No need to pass up your favorite foods. With plates held firmly by Plasti-Liner, **YOU CAN EAT ANYTHING!** Simply lay soft strip of Plasti-Liner on troublesome upper or lower. Bite and it molds perfectly. *Easy to use*, tasteless, odorless, harmless to you and your plates. Removable as directed. Money back guarantee. At your drug counter. Only $1.50. Plasti-Liner, Inc. Dept. HH; Buffalo 9, N.Y.

BRIMMS PLASTI-LINER
THE PERMANENT DENTURE RELINER

NEWER CAR $100!

YOU can purchase a newer car each year for $100—OR LESS! "AUTOMOTIVE BUYING REPORT", written by a licensed, bonded, automobile dealer tells how. Get authentic facts, figures, information, actual dealers' wholesale prices never before exposed! Stop losing hundreds yearly on car depreciation! If you have ever wanted a later model car and felt you couldn't afford it, or if you've ever lost money trading cars—this is for you. Get "AUTOMOTIVE BUYING REPORT" and be driving a newer car next week. Satisfaction GUARANTEED—OR YOUR MONEY BACK! Send $1 for your copy to: **Kemp Motor Co., 2015 N.E. 18th St., Dept. 4-S, Ft. Lauderdale, Florida**

CASTING SECRETS REVEALED!

Now you can learn how to make big money by casting thousands of perfect plaques, book ends, figurines, etc., with X-L rubber molds.
NO EXPERIENCE, VERY LITTLE CAPITAL NEEDED
X-L Rubber, Pts. $2.50; Qts. $4.00 (postage extra). Molds and enough rubber for three molds, $1.50 prepaid. U.S. only. Send 25¢ (refunded with order) for informative catalog (40 pages) describing this wonderful, exciting *Profit-making* business.

HUGE PROFITS! MORE MONEY!

PLASTIC ARTS STUDIO 3403 S. MADISON, DEPT. 3 MUNCIE, INDIANA

WHEELS WHEELS WHEELS

7" Disc Wheel ¾" Tire ⅜" sleeve	45c ea.
8" Disc Wheel 1¼" Tire ½" sleeve	70c ea.
7" Disc Wheel 1" Tire ½" Ball Bearing	80c ea.
8" Disc Wheel 1½" Tire ½" ball bearing	$1.00 ea.
6" Disc Wheel 1.50 semi-pneum. Tire ½" B.B.	$1.35 ea.
8" Disc Wheel 2" semi-pneum. T. ½" B.B.	$1.50 ea.
10" Disc Wheel 1.75 semi-pneum. T. ½" B.B.	$1.50 ea.
10" Disc Wheel 2.75 semi-pneum. Tire ⅝" B.B.	$3.50 ea.
12" Disc Wheel 1.75 semi-pneum. T. ½" B.B.	$1.95 ea.

Above wheel prices includes hub cap. Plus Postage. C.O.D.'s accepted.
AXLES—Sizes 5/16 in., ⅜ in., ½ in.—Cut to size—End holes drilled.

UNITED WHEEL STAMPING CO.
11915 S. MARSHFIELD AVE., PS-4, CHICAGO 43, ILLINOIS

BUY WHOLESALE!

30-80% Discounts! Appliances, Gifts, Typewriters, Tools, Watches, Sporting Goods, Jewelry, Cameras, Housewares, etc.

CONSOLIDATED DISTRIBUTORS
CLIFTON 4, NEW JERSEY

Kruger Pistol *Bargain* $3.00 post paid

.12 CALIBER SINGLE SHOT

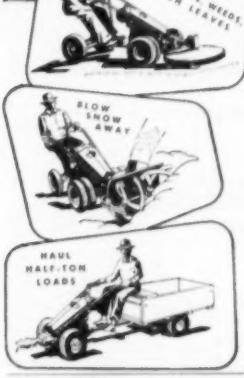
.14 MG. POWDER CHARGE

BLUE-BLACK FINISH

Crafted after famous German Luger design. Not an air or CO_2 gun. This is a small bore gun that actually shoots .12 caliber lead bullets fired by light 14 mg. powder charge. Beautiful gun, swell for target shooting. 4" steel barrel in knurled styrene stock. Overall length 8½ inches. This amazingly low price is due to ball-and-cap design. Comes with 50 bullets, instructions, and target. Money back if not satisfied.

Send $3 to **KRUGER CORP.,**
Kruger Building, Box 709-D, Alhambra, California

GRAVELY offers NEW EASE for Country Living!



An Amazing New Experience Awaits You!

You, too, will be mighty proud when everyone marvels at the beauty of your Gravely-kept place! . . . (If they but knew the *ease* and *speed* with which you do every lawn and garden job with your versatile Gravely!) . . . Whatever the job, summer or winter, your Gravely turns in a perfect performance, *with power to spare!*

Now! 30 Attachments for Every Year-Round Job

Unmatched Versatility! . . . 30 performance-proved attachments to choose from. *Plus* All-Gear Drive, Power-Reverse, Push-Button Starter. *Don't be satisfied with less!*

Write Today for Free Booklet, "Power vs. Drudgery".

GRAVELY TRACTORS, INC.
BOX 484, DUNBAR, W. VA.

EASY PAY PLAN

You can start a $40.00 a Day Business
IN YOUR SPARE TIME

MAKE BIG CASH PROFITS IN YOUR OWN HOME SHARPENING HOUSEHOLD, GARDEN, SHOP TOOLS

Now you can turn spare time into Big Cash Profits with new Belsaw Sharp-All. Sharpen knives, scissors, shears, snips, ice skates, hedge trimmers, mower blades, grass whips, axes, chisels, screw drivers, scrapers and saws. Your own CASH business with no inventory. No calls to make. No experience needed.

Learn how easily you can start your own spare-time business. Amazing low-cost, easy payment plan. Send postcard for FREE BOOK.

BELSAW SHARP-ALL CO
707 Field Building • Kansas City 11, Missouri

NOW! Be your own EXPERT CARPENTER and BUILDER!

Save Time and Money on All Kinds of Carpenter Work Around the Home or Farm

If you can drive a nail, these step-by-step how-to-do-it books will show you even how to build a house! Completely covers all those practical details of construction (with more than 500 detailed drawings and photos) that you could only learn through years of experience.

Starts with use of tools, including the steel square, how to read blue prints, selection of right woods—goes right up through intricate joints, corner construction, use of the level-transit. Includes foundations, frame-work, roofing, even builder's hardware. All in words and pictures easy to understand and follow.

SEND NO MONEY. Mail the Coupon and we'll send both volumes of "Fundamentals of Carpentry" for 5 days FREE EXAMINATION. Pay nothing now. Pay nothing to postman. Just mail coupon.

American Technical Society Dept. CK-4
848 E. 58th St., Chicago 37, Ill.

TWO VOLUMES
886 PAGES
552 PICTURES
$8.90 ONLY
COMPLETE

AMERICAN TECHNICAL SOCIETY, Dept. CK-4
848 E. 58th St., Chicago 37, Ill.

Please send me "Fundamentals of Carpentry" for 5 DAYS FREE EXAMINATION. If I decide to keep the books, I will send $8.90 for both volumes, plus shipping costs. Otherwise I will return the books and owe you nothing.

Name_____
Address_____
City_____ Zone_____ State_____

☐ If you prefer to enclose $8.90 with coupon, check here and we pay all shipping costs. Money refunded if not delighted.

To Parents of High School Students in Search of a Career...

A marketable ability is the only true security

This may be the most important message of your children's lives

You spend many hours planning your children's future, looking for ways to save them heartaches in the days ahead and give them some good measure of security.

You should know that

> Today there is a rich, new kind of opportunity for young America!

The opportunity lies in engineering and science, where there is a tremendous need for trained young people. It is open to any young man or woman who is willing to work hard and to study high school courses like mathematics and the physical sciences in preparation for college engineering.

Here is what the engineering profession offers your child:

Interesting, useful work. There are hundreds of different engineering positions open, from bridge design to nuclear research, from product planning to salesmanship.

It is rich in opportunity. Today's engineering graduates find starting salaries higher than average. As for opportunity, 50% of the country's industrial leaders started their careers as engineers.

It offers a good measure of security. The need for trained men and women engineers will continue for years to come.

Don't cheat your child of a chance for betterment in the years ahead. Write now to the Engineering Manpower Commission, 29 West 39 Street, New York 18, N. Y., for free booklet, "Engineering As A Career" or inquire of your high school principal, math or science teacher, guidance counsellor, any well-known engineer in your community, or the personnel department where you work.

A PUBLIC SERVICE PROJECT · THE ADVERTISING COUNCIL

Make SURE, SAFE INSULATED ELECTRICAL CONNECTIONS

The New

SUPER CHAMP Hand Tool

The ONE Tool for ALL Wire Sizes used in Home Wiring, Appliances, Automobiles.

DOES ALL THESE THINGS BESIDES

CRIMPS Solderless Terminals and Connectors without solder or tape for safe connections.

CUTS Wire, making clean, sharp cut through Insulation and Conductor.

STRIPS Wire sizes #22-#10. Gauges assure proper length for sure, safe crimp.

SHEARS Bolts and screws without damaging threads — no filing or hack sawing.

ORDER DIRECT – USE COUPON

Only $3.95 Post Paid

Satisfaction guaranteed or money back.
Send check or money order for $3.95.
(Penna. residents add 15¢ sales tax.)

T. W. Berger
National Distributor Consumers and Dealers

AMP Incorporated
General Offices, Harrisburg, Pa.

T. W. Berger
Dept. AP
Suite 401, 1700 Walnut St., Phila. 3, Pa.
Send me post paid the new super Champ Hand Tool. I am enclosing $3.95. (Include sales tax where applicable.)
☐ check ☐ money order

NAME _____
ADDRESS _____
CITY _____ ZONE ____ STATE _____

Locksmithing AND KEY MAKING

Now Made Easy! Practical up-to-date course teaches you how to pick locks, de-code, make master keys, repair, install, service, etc. New self-instruction lessons for every handyman, homeowner, carpenter, mechanic, service station operator, fix-it shop, hardware dealer, gunsmith. 52 easy illustrated lessons. Full price only $5.95, postpaid; or C.O.D. plus postage. Satisfaction or refund guaranteed.

Complete course $5.95 now only

Nelson-Hall Co., Dept. DT-1
210 S. Clinton St., Chicago 6, Ill.

CHILD'S ELECTRIC POWERED SPORT CAR

for children 4 to 10 years old
Forward, neutral, reverse shift!
Equipped with battery charger
Amazing LOW price!

Write for FREE CATALOG
SPECIALTY TOY MFG. CO.
(Dept. 6) 807 Beatrice Dr., Akron 10, Ohio
PS-457

TILT ARBOR SAW $16.95 SOLD DIRECT FACTORY TO YOU

Save big money on this complete 8 in. Tilt Arbor Saw. Sold direct factory to you. All cast iron and steel construction. Big — Sturdy — weighs 25 lbs. Crosscuts, rips, bevels, mitres, cuts compound angles. Uses any ¼ to ½ H.P. motor. Reg. $4.95 — 8 in. Simonds Blade included. Try 10 days. If you are not satisfied FOR ANY REASON, return saw for absolute money back refund. Ship express collect. Send check, M.O. or sent C.O.D.

Write For FREE CATALOG Big Bargain On Power Tools

AMERICAN MACHINE & TOOL CO.
ROYERSFORD 7, PA.

ENGINEERING

Photo of Heald Electrical Laboratory

Enroll Now for New Term

Heald College Ranks FIRST West of the Mississippi in "Who's Who" in America

Send for FREE Information

Heald Engineering College
Van Ness at Post, Dept. PS 457
San Francisco, California

Thousands of Engineers Needed for Hard Pressed Industry

BACHELOR OF SCIENCE DEGREE, 27 MONTHS

Degree Courses:
- ☐ Electronic Engineering
- ☐ Electrical Engineering
- ☐ Highway Engineering
- ☐ Mechanical Engineering
- ☐ Structural Engineering
- ☐ Civil Engineering
- ☐ Architecture

Diploma Courses:
- ☐ TELEVISION ☐ Color TV
- ☐ Tool & Die Design
- ☐ Architectural Drafting
- ☐ Mechanical Drafting
- ☐ Structural Drafting
- ☐ Surveying
- ☐ Estimating
- ☐ Master Electrician

Approved for Veterans

NAME _____
STREET _____
CITY _____
STATE _____

THIS OFFER MAY BE WORTH

$1,000,000 to You

in Health, Vigor and Well-Being!

Without any obligation or binding, costly, monthly Purchase Plans

FREE 25-Day Supply High-Potency VITAMINS

Including "Red" Vit. B_{12}, Folic Acid & other Stimulants for Growth of

RED BLOOD cells

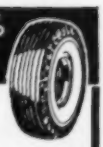
Compares with products that Retail up to $7.95 per 100

Each VIMATRIN CAPSULE Contains

Vit. A	5000 units
Vit. D	500 units
Vit. B_{12}	3 Mcg.
Folic Acid	0.25 Mg.
Vit. B_1	4 Mg.
Vit. B_2	1 Mg.
Vit. B_6	0.5 Mg.
Cal. Pante	1 Mg.
N. Amide	25 Mg.
Vit. C	30 Mg.
Choline	25 Mg.
Inositol	25 Mg.
Vit. E	2.7 I.U.
Calcium	215 Mg.
Phosphorus	165 Mg.
Iodine	0.15 Mg.
Iron	12 Mg.
Magnesium	1 Mg.
Potassium	1.5 Mg.
Copper	1 Mg.
Manganese	1 Mg.
Zinc	1 Mg.
Molybdenum	0.2 Mg.
Fluorine	0.1 Mg.
Cobalt	0.15 Mg.

We pay the expense of this sensational offer . . . . not just a sample, but a full, **FRESHLY-PACKED,** 25-day supply of amazing **VIMATRIN,** the new 25 **VITAMIN-MINERAL FORMULA** . . . because we're sure this trial will prove that you, too, like many thousands of others, may experience a new feeling of health, youth and well-being, a new zest for life. Each easy-to-take **CAPSULE** supplies your body with 13 vitamins and 12 minerals in new higher potencies equal to, or exceeding the minimum daily requirements. Also **FREE,** famous Vitamin-Quota Guide Book. Answers perplexing vitamin questions and shows how to **SAVE UP TO 50%** on the same vitamins your doctor advises. All absolutely **FREE,** no obligation to buy anything. Supply limited. One to a family, please. Enclose 25c to cover cost of packing and mailing. Send for your supply today. **VITAMIN-QUOTA, Dept. T-677, 880 Broadway, N. Y. 3, N. Y., or Dept. T-677, 1125 Crenshaw Blvd., Los Angeles 19, Calif.**

SAVE UP TO 70% on NEW TIRE COST



TIRES

FACTORY ADJUSTED
NOT SECONDS!

90% to 100% ORIGINAL TREAD

NEW TIRE GUARANTEE

White Walls Available in 15" Sizes Only..... $2.00 Each Added

670 x 15	$7.95	800-820 x 15	$9.95
710 x 15	$8.45	600 x 16	$7.95
760 x 15	$8.95	650 x 16	$8.95

No Federal Excise Tax Added
Road hazards not adjusted—No freight paid

H. & H. TIRE CO. *All prices f.o.b. Chicago* 449 W. 35th St., Dept. S-1, Chicago, Ill.

FREE "How To Start Your Own MAIL ORDER BUSINESS"

Earn from $10,000 to $20,000 spare time. We'll put you in business and furnish you with everything needed. Exclusive new catalogs every three months . . . Offer your customers one item free for every two they buy! Free advertising and no stock for you to buy. We ship for you under your own name. No experience required. Write today for free booklet and franchise data.

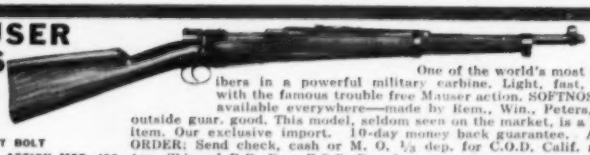
MAIL ORDER ASSOCIATES, PARAMUS 53, NEW JERSEY

help your
HEART FUND
help your HEART

7MM MAUSER CARBINES

GUAR. GOOD CONDITION

$19.95



SPECIAL: 7MM Mil. AMMO 20 rds. $1.00 with purchase of gun. Addit. AMMO per 100 rds. $7.50.

6 SHOT BOLT ACTION MOD. '98

One of the world's most popular hunting calibers in a powerful military carbine. Light, fast, extremely accurate with the famous trouble free Mauser action. SOFTNOSE HUNTING AMMO, available everywhere—made by Rem., Win., Peters, Western. Bore and outside guar. good. This model, seldom seen on the market, is a bona fide collector's item. Our exclusive import. 10-day money back guarantee. All milled parts. TO ORDER: Send check, cash or M. O. 1/3 dep. for C.O.D. Calif. resid. add 4% state tax. Shipped R.R. Exp. F.O.B. Pasadena.

GOLDEN STATE ARMS CORP., 386 W. Green St., Pasadena 25, Calif.

MODERN IMPROVED LAWN MOWER SHARPENER AND BED KNIFE GRINDER

$275.00 FOB PASADENA, CALIF.

Grinds any reel type mower. Hollow grinds or flat grinds bed knives. New micro feed grinding head. Sharpens hand and power mowers. No disassembly of wheels, Roller, handle or gasoline engine. No draining of gasoline or oil. Precision sharpens more mowers per hour. Costs less. Compare before you buy. If it isn't a MODERN it can't be MODERN.

WRITE FOR FREE BOOKLET 11B

The Modern Lapping Machine is designed to fit the needs of any large user of mowers and the lawn mower shops. Laps any reel type mower. 1/3 H.P. motor, $67.95 fob, Pasadena, Calif.

MODERN MFG. CO., 160 N. FAIR OAKS, PASADENA, CALIFORNIA

MEN PAST 40

Troubled with GETTING UP NIGHTS, Pains in BACK, HIPS, LEGS, Tiredness Loss of Physical Vigor

If you have these symptoms then your troubles may be traced to Glandular Dysfunction . . . a constitutional disease. Medicines that give temporary relief will not remove the cause of your trouble. Neglect of Glandular Dysfunction often leads to premature old age and sometimes incurable malignancy.

The past few years men from over 3,000 communities have been successfully treated here at the Excelsior Institute. They have found soothing relief and a new health and zest in life.

The Excelsior Institute, devoted to the treatment of diseases peculiar to older men by **NON-SURGICAL** methods has a NEW FREE BOOK that tells how Glandular Dysfunction may be corrected by proven **NON-SURGICAL** treatments. This book may prove of utmost importance in your life. Write today. There is no obligation.

Excelsior Institute, Dept. 8531, Excelsior Springs, Mo.

SALE

16 X 50 REGULARLY $69.50 SAVE $44.51!

High powered, whisper-weight (27 oz.!) color corrected, Achromatic binoculars, 7" high! EZ to hold. EZ to focus. Instant finger-tip adjustment. **SALE PRICE FOR THIS SALE ONLY** including case and straps! Made in Japan. **USE 30 DAYS.** If not satisfied return for refund. **$24.99** *Add tax*

UNITED BINOCULAR CO., 9043 S. Western, ARF-4016, Chicago 20. **DEALERS WANTED**

FREE-U.S. STAMPS

U. S. 1943 Bi-Colored Flag of Occupied Nations (as illustrated) Airmails, Commemoratives, Regular Issues, included in this collection of 25 selected, all different, genuine U.S. stamps. PLUS VALUABLE U. S. $5.00 STAMP. Everything for 10c to cover mailing expenses. Approvals included. Act at once.

WILLETT CO., P.O. Box 390, Dept. 606, Mount Kisco, N. Y.

IT'S EASY . . . MAKE MONEY IN PHOTOGRAPHY

If you are over 17—good pay and fascinating work await you in photography! Start making money quickly in sparetime—step into your own studio or exciting career job. LEARN-BY-DOING method trains you at home! Write TODAY for FREE catalog. Also Resident Training. Co-ed. 47th Year. Approved for Veterans.

NEW YORK INSTITUTE OF PHOTOGRAPHY
10 West 33 Street New York 1, New York
Dept. 5 **47th YEAR**

SAVE 50% & MORE! GENUINE DIAMONDS

Buy diamonds and diamond jewelry half-priced from Kaskel's, America's foremost Diamond Specialists. Every diamond is set in a luxurious new mounting . . . *graded* according to nationally accepted standard . . . and *bonded* to this effect. For over 70 years, we've served over 1,000,000 satisfied customers. **CASH OR CREDIT**

10 DAY UNCONDITIONAL MONEY-BACK GUARANTEE
References: Your bank, or any Rating Agency.

SEND FOR BIG FREE ILLUSTRATED CATALOG

KASKEL'S, 41 West 57 St., N. Y. 19, Dept. 708-D
Send FREE CATALOG and Advice about DIAMONDS without obligation. No Salesman Will Call.
NAME . . . . . .
ADDRESS . . . . . .
CITY . . . . . STATE . . . . . .

BE *More* UP-TO-DATE WITH THE 1957

JUMBO-SIZED EDITION 10" x 7"

OVER 750 MAIN ARTICLES

NEARLY 400 SIGNED ARTICLES

Published ANNUALLY for 35 Years . . . **$12.00** When you want to be sure of your facts . . reach for your Americana Annual

MORE THAN 900 PAGES

AMERICANA ANNUAL

priceless informative FACTS..

The Americana Annual offers more than any comparable book! It covers an entire year's events . . . gives all the information needed to keep you informed socially and for business . . . *at your fingertips in one permanently bound volume.*

SPECIAL FEATURES

Outstanding news and features of the year are presented by top authorities. This year's Americana Annual . . . with over 900 pages of information, pictures and 750 main articles . . presents an illustrated chronology of the year's events . . . biographies of most newsworthy personalities . . a sports review of outstanding events and championships in all major sports. . articles on all countries in the world . . a detailed listing of 1956's major plays and motion pictures, and . . .

- The International Geophysical Year
- International Relations
- United States • Canada
- Entertainment and Arts
- World Security • The Middle East
- Congress and Ambassadors
- Science

MORE THAN $100,000 SPENT ON 1957 EDITION

Top journalists, photographers and statisticians contribute the most important and newsworthy stories, pictures and maps, charts and cartoons of the year. Nearly 400 world-renown authorities worked to produce the most authenticated, concise and up-to-date coverage of important world happenings of 1956. Famous contributors include . . Harry J. Anslinger, Franklin L. Burdette, Ewan Clague, Admiral George Dufek, Arthur S. Fleming, General Lewis B. Hershey and J. Edgar Hoover.

Mail Coupon TODAY for 7 Day FREE Inspection

AVAILABLE BY MAIL ORDER ONLY

AMERICANA CORPORATION Dept. PS457
333 N. Michigan Avenue—Mail Order Division
Chicago 1, Illinois

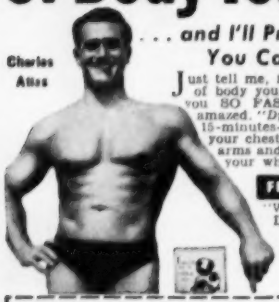
Gentlemen: Please send me _____ copies of the 1957 Americana Annual at $12

☐ Check enclosed (Save Shipping Charge)
☐ Bill me later

It is understood that if I am not completely satisfied that I may return the Americana Annual within 7 days for a full refund.

Name _____
Address _____
City _____ Zone ____ State _____

Check the Kind of Body You Want



Charles Atlas

. . . and I'll Prove How EASILY You Can Have It!

Just tell me, in coupon below, the kind of body you want—and I'll give it to you SO FAST your friends will be amazed. *"Dynamic Tension,"* my easy, 15-minutes-a-day method, will make your chest and shoulders bulge . . . arms and legs surge with power . . . your whole body feel "alive!"

FREE BOOK Tells how I became "World's Most Perfectly Developed Man"— Mail coupon! CHARLES ATLAS, Dept. 1D, 115 East 23rd Street, New York City 10, N. Y.

CHARLES ATLAS, Dept. 1D
115 East 23rd St., New York 10, N. Y.
Dear Charles Atlas: Here's the Kind of Body I want!

(Check as many as you like)

- ☐ More Weight—Solid—in the Right Places
- ☐ Broader Chest, Shoulders
- ☐ Powerful Arms, Legs, Grip
- ☐ Slimmer Waist, Hips
- ☐ Better Sleep. More Energy

Send me absolutely FREE a copy of your famous book showing how "Dynamic Tension" can make me a new man—32 pages, crammed with photographs, answers to vital questions, and valuable advice. No obligation.

NAME _____ AGE _____
(please print or write plainly)
ADDRESS _____
CITY _____ STATE _____

PREPARE FOR THE BEST JOBS IN INDUSTRY

TRAIN at HOME in Your Spare Time or at **ALLIED INSTITUTE** in Chicago

- MECH. ENGINEER
- DRAFTSMAN
- TOOL DESIGNER
- TOOL ENGINEER
- MASTER MACHINIST
- AIR CONDITIONING HEAT & REFRIGERATION

MORE JOBS THAN GRADUATES

Shortages of Draftsmen, Designers, Tool Engineers, Machinists, Air Conditioning technicians are so widespread that you can pick a highly paid key job and look forward to Achievement and Security. You can begin your training in Short Courses at home or at Allied Institute, and continue progressively toward an Engineering Degree in 26 months. Allied is approved by Industry, National Home Study Council, Central Schools Association, Dept. of Education, Office of Public Instruction, State of Illinois, U. S. Veterans Admin., U. S. Dept. of Justice.

SEND FOR FREE BOOKS

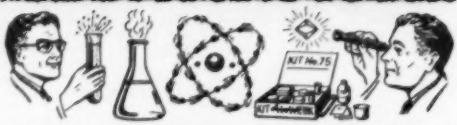
ALLIED SCHOOL OF MECHANICAL TRADES
1338-42 South Michigan Ave., Dept. PS-4, Chicago 5, Ill.

Send me without obligation information on your courses:

☐ HOME STUDY ☐ RESIDENT ☐ VETERAN ☐ NON VETERAN
☐ DRAFTING ☐ ENGINEERING ☐ AIR CONDITIONING

NAME _____
ADDRESS _____
CITY _____ COUNTY _____ STATE _____

KIT of the WEEK!



How would you like to receive a new fascinating **SCIENCE KIT EVERY WEEK!** A thorough, practical education (a golden money-making idea included in each kit!) as well as an **IMMENSE** amount of fun **EVERY WEEK!** Chemicals, equipment, electronic parts, etc., included, as each kit requires! Fun, education and profit, all in one! JUST SEND $1.00 FOR YOUR FIRST **GIANT KIT** AND FULL DETAILS! Each kit is complete!

FREE! Chemical puzzle worth **$25.00** if you solve it! Free with first kit! Interested in Chemistry? Ask for free catalog! Fascinating courses, $2.00 and up!

NATIONAL SCHOOL OF CHEMISTRY, Box No. 606-E, Redwood City, Calif.

AMAZING NEW PERSONAL POCKET RADIO

LISTEN IN PRIVATE WHILE YOU WALK!

SMALLER AND LIGHTER THAN ANY TRANSISTOR "POCKET RADIO"! Wt. only ½ lb. Size 1"x2⅝"x4¾" complete. Black Gold breakproof plastic case. POSITIVELY NO HOOKUPS OR WIRES NEEDED! BUILT IN 1000 MILE ANTENNA! Snap in flashlight batteries lasts for months. "Glow in the Dark"; Easy to use top controls (while walking, riding, etc.). Has special tiny, soft plastic almost invisible earplug—LETS YOU ALONE LISTEN ANYTIME, ANYWHERE without anyone else knowing you are hearing radio music, sports, news, weather, etc. GUARANTEED TO WORK ANYWHERE. ONE YEAR SERVICE GUARANTEE.

SEND ONLY $5.00 (ck, mo) and pay postman $14.95 plus postage. A REAL $39.95 VALUE! AVAILABLE NOW ONLY FROM US AT HALF PRICE. NOT AN UNWORKABLE INCOMPLETE KIT OF PARTS OR PLAYTHING. A REAL MIDGET PERSONAL POCKET SIZE RADIO. Get yours now. So rush your order now for YOUR TINYTONE POCKET PERSONAL RADIO. Available only from:
WESTERN RADIO, Dept. APS-4, KEARNEY, NEBR.

250 POWER . . . . .

Complete Telescope Lens Kit only **$3.49** postpaid

Conquer Space, Explore the Universe, Planets, Moon craters, New Stars, etc. Complete Lens Kit consists of 60 inch focal length ground and polished objective lens, eyepiece lenses for 50 POWER, 100 POWER, 150 POWER, 200 POWER, 250 POWER, and all necessary lens fittings. Easy to make from simple step by step instructions. (Tripod and mount not included.) Money back guarantee.

BUSSE SALES CO., Hartford, Conn., Dept. PS-54

Now 1957 **SPORTABOUT CARS and GOLF CARS.** Write for literature.

ESHELMAN TRACTORS

LOW AS $99

Plows - Cultivates - Saws
Cuts - Dozer - Harrows
Hauls - Snow Plows - Rolls. Eshelman Tractors, Tillers, Riding Rotary Mowers for Better Lawns and Gardens. Advertised in GOOD HOUSEKEEPING. Thousands of satisfied users. Write for Free Literature.
Dept. 95, ESHELMAN, Balto. 2, Md.

Illus. Model $179.75

Shipping Points: BALTIMORE - CHICAGO - RENO

SAVE & MORE HALF on Famous Brand NEW TIRES

ABSOLUTELY NEW!
Not used, or recaps or retreads!

Our tremendous buying power enabled us to get these new factory reject tires from wholesale & pass the savings on to you.

LIFETIME GUARANTEE Golden Rule — Instant replacement on any defective tire, frt. excl.

600-16		710-15		750-20	$15.50
670-15	$6.95	760-15	$7.25	750-20 (10)	$18.50
White Walls $1. ext.		800-15		$25-20	$20.25

900-20	$22.50
1000-20	23.50
1100-20	24.50

Also All Other Sizes & Types In Stock Full price Pa. buyers add 3% sales tax.

12 MO. GUAR. Very slightly used. Any Car. $3.25 White Walls $1. Extra

Rush Ck. or Money Order today. Stock Limited. Shipments sent F.O.B. Phila.

MARVIN BLATT 609 Spring Garden Philadelphia, Pa.

Mil. Mud Grip Guar. 12 Mos.
900-16 (8 ply) $17.50 ea.
900-20 (8 ply)

CASH FILING SAWS

Start in Spare Time with a FOLEY SAW FILER

Here is a steady repeat CASH business you can start at home in your basement or garage, while you are working at your regular job. No experience is necessary to turn out perfect cutting saws—"the first saw I sharpened came out 100%. I think the Foley Saw Filer is a marvel of perfection," writes Clarence E. Parsons. Every saw you sharpen will bring you new customers. You will find you can make up to $3 or $5 an hour—$20 to $30 a week in your spare time as a starter.

With a Foley Saw Filer you can file all hand saws, also band and cross-cut circular saws. It is easy to operate—simple adjustments—no eye-strain. Patented jointing principle evens up all irregular teeth and makes an old saw cut just like new.

This Free Book Shows How To Start Your Own Cash Business →

"MONEY MAKING FACTS" shows you how to get plenty of saws to file without canvassing, and how you can develop into a general repair shop that will be your own business. This is a helpful, practical book that tells just what to do—send for your free copy today. No salesman will call.

FOLEY MFG. CO., 419-7 Foley Bldg.
Minneapolis 18, Minn.
Send me free book "MONEY MAKING FACTS."

Name.....
Address.....
City..... State.....

WE DON'T NEED ENGINEERS

. . . but they write to us daily to order our GENIAC Electric Brain Construction Kits.

So do TEACHERS, SCIENTIFIC AMATEURS, INDUSTRIAL FIRMS and schools. (See list below.)

THOUSANDS OF SATISFIED CUSTOMERS have bought GENIACS on a 7 DAY REFUND guarantee

We are proud to offer our 1957 Model, with up to the minute improvements for the thousands of new customers who can use them.

WHAT IS A GENIAC?

Here is a picture of the 1957 Model GENIAC in the display rack ($3.00 separately) which comes with every kit.

GENIAC stands for *Genius Semi-Automatic Computer*. A kit of specially designed switch decks and racks which permit the user to construct more than thirty different machines (following directions and wiring diagrams) and as many more as he is able to design himself. These machines demonstrate the applications of electric circuitry.

APPLICATIONS OF GENIAC

SIMPLE COMPUTER CIRCUITS for binary, decimal adding, subtracting, dividing, multiplying machines. PROBLEMS in symbolic logic, reasoning, comparing. PSYCHOLOGICAL TESTING and EXPERIMENT GAME PLAYING CIRCUITS for tit-tat-toe and nim. ACTUARIAL ANALYSIS.

SOME OF OUR CUSTOMERS

Allis-Chalmers • Remington-Rand • International Business Machines • Manuel Missionary College • Barnard College • Westinghouse Electric • Phillips Laboratories • General Insurance Co. of America • Lafayette Radio • Ronr Aircraft Co. • Albert Einstein Medical College • Naval Research Laboratories • Board of Education, Tecumseh, Nebraska • Los Angeles Public Schools • Jefferson Union High School • Oklahoma A & M • Courtland Jr. High School • Bell Telephone Laboratories.

WHAT COMES WITH THE KIT?

BOOKS—1. SIMPLE ELECTRIC BRAINS, AND HOW TO MAKE THEM . . . 64 page experiment manual.—NEW! 2. MINDS AND MACHINES . . . 200 page text on computers, automation and cybernetics.—NEW! 3. WIRING DIAGRAMS for basic GENIAC circuits.—NEW! 4. Beginners Manual for the person who has little or no familiarity with electric circuits.—NEW! 5. GENIAC study guide . . . the equivalent of a full course in computer fundamentals, lists additional readings.

PARTS—PANELS, DISCS, RACK (for easy assembly and display). Hardware, wire, tools, battery, holder etc. for more than thirty machines.

SEND for your GENIAC now. At only $19.95, a bargain, comes complete with over 400 parts and components, 5 books and manuals. We guarantee that if you do not want to keep GENIAC after one week you can return it for full refund.

Add 50c west of Miss. $2 outside U.S. Mail Name & Address with Check or Money Order to

OLIVER GARFIELD CO., DEPT. PS-47B — **126 LEXINGTON AVE. NEW YORK 16, N.Y.**

Enjoy real security . . . earn top wages . . . get ahead faster. Learn a trade where Trained Men are always in demand. High starting salary, plus hundreds of opportunities for advancement in the fast-growing Oil Burner industry, which U. S. Government predicts will double in size in next few years. We teach you Installation, Operation, Maintenance and Servicing. Complete course. Remember, Trained Men command best jobs — highest wages. *Our Oil Burner graduates are 100% employed.*

LEARN AND EARN IN YOUR SPARE TIME

Put your spare time to work. Learn a specialized trade. No previous experience or special education necessary. Act today! Cash in tomorrow! Earn while you learn, doing repair jobs in your own area. Low tuition, only $5 starts you! Tools furnished. Send coupon now! No obligation.

Mass Trades has trained thousands for success since 1938.

RESIDENT SCHOOL — APPROVED FOR VETERANS

WRITE NOW FOR FREE SAMPLE LESSON AND BOOKLET

MASS. TRADES
163 High Street, Boston 10, Mass.
Please send me FREE sample lesson and booklet
NAME ..... AGE .....
ADDRESS .....
CITY ..... ZONE ..... STATE .....

BE YOUR OWN MUSIC TEACHER

Send for Free Book Telling How Easily You Can Learn Piano, Guitar, Accordion, ANY Instrument This EASY A-B-C Way

NOW IT'S EASY to learn music at home. No tiresome "exercises." No teacher; just START RIGHT OUT playing simple pieces. Thousands now play who never thought they could. Our pictured lessons make it easy as A-B-C to learn to play popular music, hymns, classical, and any other music. Only a few cents a lesson. Over 900,000 students! (Our 59th successful year.)

Mail Coupon for FREE BOOK

Find out why our method can teach you quickly, easily, inexpensively. Write for 36-page illustrated book. No obligation. Mention your favorite instrument. Just mail coupon. (No salesman will call.)

U. S. SCHOOL OF MUSIC
Studio A154,
Port Washington, N. Y.

U. S. SCHOOL OF MUSIC, Studio A154, Port Washington, N. Y.
Please send me Free 36-page Illustrated Book. I would like to play (Name instrument).

Instrument _____ Have you Instrument? _____

Name _____ (Please Print)

Address _____

Boost Your Power!

FAN-O-MATIC

Automatic FAN RELEASE

PAT. PEND.

Automatically disengages fan at speeds over 40 mph!

At speeds over 35 MPH, standard automobile fans waste horsepower! The FAN-O-MATIC now makes your fan a free-wheeling unit, releasing wasted horsepower at speeds over 40 MPH.

- **Increases Available Horsepower . . . up to 15 HP**
- **Increases Gas Mileage . . . up to 2 mpg.**
- **Increases Acceleration . . . up to 10%**
- **Reduces Engine Noise**
- **Reduces Vibration**

ADAPTABLE TO ALL CARS — SIMPLE TO INSTALL

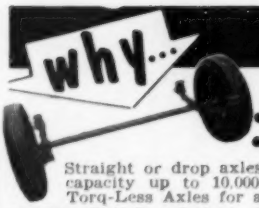
Tested and proved on Indianapolis Speedway under supervision of U. S. Auto Club.

2150

QUALITY SOLDE SEAL PRODUCTS

At your Garage, Ser. Sta. or Car Dealer!
If your dealer does not yet have it, ask him to write us for Jobber who can supply him.

RADIATOR SPECIALTY CO.
CHARLOTTE, NORTH CAROLINA



YOU SHOULD EQUIP YOUR TRAILER WITH

BULL DOG
- **AXLE ASSEMBLIES**
- **JACKS • COUPLERS**

Straight or drop axles in single or tandem—capacity up to 10,000 lbs.—any width. Also Torq-Less Axles for all types of trailers.

JACKS—Bull Dog Jacks make hitching and parking a one-man job.

COUPLERS—Bull Dog Couplers hitch or unhitch to trailer in a moment.

Write today for FREE Descriptive folder 14D

HAMMER BLOW TOOL COMPANY
WAUSAU, WISCONSIN

LEARN PLASTICS

COMPLETE LOW COST SHOP METHOD HOME TRAINING NOW AVAILABLE

Get in on Big Money opportunities in Plastic molding, casting, forming, carving, etc. Earn as you learn with Interstate's professionally prepared course. All plastic materials furnished.

WRITE FOR FREE BOOKLET

INTERSTATE TRAINING SERVICE
DEPT. C-2, PORTLAND 13, OREGON

FIX OUTBOARD MOTORS

POWERMOWERS, AND ALL SMALL 2 & 4-CYCLE GASOLINE ENGINES

Repair your own equipment or MAKE EXTRA MONEY in this growing field. Fully illustrated, easy-to-understand, Home Study Course. Write for FREE information.

LINCOLN TECHNICAL INSTITUTE
SUITE 4-G, 472 MARKET STREET, NEWARK 5, N. J.

Would You Like to Make **$1,000 A MONTH?**

That's what Stanley Hyman made selling the amazing new Presto Fire Extinguisher! Many others "cleaning up"—so can you! Amazing tiny new extinguisher ends fires fast as 2 seconds. **Guaranteed for 20 years!** Sells for only $4.95. Write for **Free** sales kit.

Merlite Industries, Presto Div.,
114 E. 32nd St., Dept. P-16U, New York 16, N. Y.

Find HIDDEN TREASURES

GOLD, SILVER, PRECIOUS METALS with the Famous Model 27 Metal Detector. Lightweight, ultra-sensitive, low cost. None finer. Also GEIGER COUNTERS for uranium and the VIOLITE for tungsten. INFORMATION FREE

THE *Detectron* CORP.
5528 Vineland Ave., No. Hollywood, Calif.

NEW MAGIC RADIO WALKIE TALKIE!

YOUR OWN POCKET SIZE RADIO STATION!

BROADCASTS TO ANY HOME OR CAR RADIO WITHOUT WIRES OR HOOKUPS! Wt. only 8 oz. Size (1½x2½x4½". Built-in telescoping antenna. Powerful Transistor-sensitive microphone, frequency setter, break-in switch! Runs for weeks on self-contained flashlight batteries. Durable plastic case. With this Radio Talkie you CAN TALK TO YOUR FRIENDS UP TO A BLOCK OR MORE AWAY! Talk up to 1 mile or more between two automobiles. INSTANT OPERATION! Just push button to talk! No license needed. Uses inductive field magnetic radiation. Useful and real fun in a million ways! GUARANTEED TO WORK. 1 YEAR SERVICE GUARANTEE.

SEND ONLY $2.00. (cash, ck, mo) and pay postman $9.99 COD postage or send $11.98 for prepaid delivery. COMPLETE READY TO OPERATE with instructions and hundreds of ways and tricks for broadcasts thru any radio you desire. Price may go up soon, so get your NEW POWERFUL RADIO-WALKIE TALKIE NOW. Available only from: **WESTERN RADIO, Dept. RPS-4, KEARNEY, NEBR.**

This entire lawn planted in Mondo "Grass"

NOW IS GOOD TIME TO PLANT

BLUE-GREEN MONDO "GRASS"

Trade Mark Registration applied for U.S. Patent Office

REQUIRES NO MOWING—MAKES WORLD'S MOST BEAUTIFUL LAWN

Our Blue-Green Mondo "Grass" is described by the U. S. Department of Agriculture as "Ophiopogen Japonicus (formerly called Mondo Japonicus)," is native to Northern China and should withstand severe degree of freezing; drought tolerant, evergreen, commonly called Mondo "Grass."

It is a "grass" relative to the lily with paper thin blades 1/16" wide. This sod-forming EVERGREEN, low-growing oriental genus is currently used by many owners of distinctive homes in America for lawn grass. Now we can offer this exclusive Blue-Green Mondo "Grass" at popular prices.

SO HARDY IT CAN BE PLANTED ANYTIME. It is recommended for beautiful lawns where mowing is not desired. Blue-Green Mondo "Grass" retains its color the year-round; thrives in shade or sun; extremely hardy, rarely requires watering, fantastically beautiful, drooping low to the ground in weeping style year after year. REQUIRES NO MOWING AND SHOULD NEVER BE MOWED.

Guaranteed to withstand severe freezing or money refunded. Ideal for heavy shaded areas, dry or wet. FREE folder of testimonials and many photos of Mondo "Grass" lawns sent on request.

Mondo is resistant to diseases; insects and animals will not feed on it. Stops erosion; grows compactly, crowding out other grass and weeds; multiplies rapidly, approximately 100 times (10,000%) first year. Enhances property value. So sensational we expect to revolutionize lawn-making. For good coverage first year plant 4" to 12" apart. Numerous rooted blades to sprig.

Planting and culture instructions with each order. Shipped now or when desired. Remittance with order. Shipped prepaid. MONEY-BACK GUARANTEE; if not completely delighted you may return at once for refund. Open account to A-1 rated firms buying 1,000 sprigs or more, FOB, Biloxi. Distributors wanted everywhere.

ORDER TODAY . . . YOU CAN'T LOSE!

Sprigs packed in damp moss. Guaranteed to grow or we will replace.

25 Sprigs	$ 2.98
50 Sprigs	5.00
100 Sprigs	9.00
500 Sprigs	40.00
1,000 Sprigs	79.00
5,000 Sprigs or more per 1,000	50.00

MONDO GRASS & NURSERY CO., Dept. PS, Biloxi, Miss.

Please send prepaid ..... Sprigs of Mondo "Grass," for which I enclose $.....

Name.....

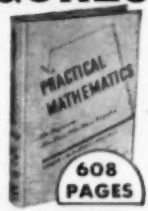
Address.....

City..... State.....

YOU, TOO, CAN BE A WIZARD at FIGURES

MAIL COUPON for New Book that Makes Mathematics EASY

READ 5 DAYS FREE!



608 PAGES

Had trouble with MATHEMATICS, like so many other people? You probably were taught incorrectly. Try this new step-by-step method, with easy-to-understand examples right in your own home in spare time. Makes learning MATH a snap. It's all due to proper presentation, and you'll now find it not only easier, but actually fascinating. To get ahead on any job, you need to know your mathematics. It's a social asset, too. Why not try this method and see?

SEND NO MONEY. Just mail the coupon, and we'll send you "Practical Mathematics" for 5 days FREE EXAMINATION. Pay nothing now. Pay nothing to postman. Just mail coupon.

AMERICAN TECHNICAL SOCIETY, Dept. CE-4
848 E. 58th St., Chicago 37, Ill.

Only $3.95 COMPLETE

Contents Include: Basic arithmetic simplified. How to solve problems with fractions quickly. Short cuts to figuring weights and measures. Methods for figuring areas and volume. How to use Logarithms and figure square root.

AMERICAN TECHNICAL SOCIETY, Dept. CE-4 **JUST MAIL THIS**
848 E. 58th St., Chicago 37, Ill.

Please send me "Practical Mathematics" for 5 days FREE EXAMINATION. If I decide to keep the Book, I will send you $3.95 within 5 days, plus shipping costs. Otherwise I will return it and owe you nothing.

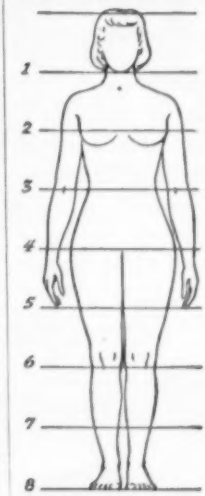
NAME.....

ADDRESS.....

CITY..... ZONE..... STATE.....

☐ If you prefer to enclose $3.95 with coupon, check here, and we pay all shipping costs. Money refunded if not delighted.

Make Money in ART



It's EASIER Than You Think!

DRAWING at left shows how to proportion average human figure, 8 heads tall. General art instruction has been simplified same way in our famous home study course. With it, you can develop artistic ability you never dreamed you had—train for top pay in Illustrating, Cartooning, Design, Fashion Art, Lettering, Portraits, TV. Low cost. Individual supervision.

SEND FOR FREE BOOK.

Describes our methods. Quotes students. Talent Test also sent free. No obligation. No salesman will call. Mail coupon now. **Washington School of Art, Studio 154, Port Washington, N. Y.**

WASHINGTON SCHOOL OF ART (Estab. 1914)
STUDIO 154, PORT WASHINGTON, N. Y.

Send me **—FREE—** Illustrated book, "Art for Pleasure and Profit," plus **free talent test.** No obligation. No salesman will call.

Name.....
(Please Print)

Address.....

City..... State.....

DRAFTING *and* BLUE PRINTING *pay* BIG MONEY

LEARN AT HOME IN SPARE TIME

You will be sent professional drafting instruments, drafting equipment, drafting lesson manuals, portable drafting table, etc. You learn by making actual drawings. Everything furnished on a **PAY AS YOU LEARN PLAN.**

REVOLUTIONARY NEW METHOD

Teaches you quickly the hows and whys of Mechanical, Machine, Structural, Architectural, Electrical Drafting, etc.

LIGHT PLEASANT WORK

and Drafting and Blue Printing in addition to paying good wages often lead to top managerial positions.

MAIL COUPON *for* FREE BOOK

CHRISTY TRADES SCHOOL Dept. DB-804
4804 N. Kedzie Ave., Chicago 25, Ill.

Mail me at once your big FREE book on Drafting and Blue Printing. Tell me how I can get your Home Training and Professional Drafting Instruments, Drafting Table, Drafting Equipment, etc., on a **PAY AS YOU LEARN PLAN.**

Name..... Age.....
Address.....
City..... Zone..... State.....

... TURN CONCRETE *INTO GOLD!*

MAKE UP TO $75 A DAY IN YOUR OWN BUSINESS

If you want to have your own business — to start a business on your own — here's your big opportunity! New high speed, low cost General block machine produces up to 1,000 concrete blocks a day. Sell all you make to builders, supply houses, and others for homes, factories, buildings, garages. Cash in on the building boom! You can make profits of 100% to 150% — up to $75 a day! General block machine equipped with ½ h.p. electric motor — or can be supplied with gasoline engine — works anywhere, in little space, indoors or out. Operates from ordinary house light socket. Simple, foolproof 3 step operation — so easy a child can do it. Makes superior 3 core blocks any size from 4" to 12". Also makes chimney, sash, corner and other types. Blocks meet any building code anywhere in the country. Materials — sand, water, cement, available anywhere. Simple illustrated operating instructions and mixing formulae for cement and cinder blocks supplied with each machine. Write for FREE folder with full information.

MOTOR DRIVEN

R. L. T. of New York City reports: "MY GENERAL BLOCK MACHINE PAID FOR ITSELF IN FIRST 2 WEEKS!"
Hundreds now in use the world over! Write for FREE details today!

EXTRA *Amazing illustrated book gives floor plans for 6 sensational concrete block bungalows. Tells how to lay blocks, lay out building lines, mix concrete, build steps, porch and concrete floors all at great savings. Written by experts. Can save many times the cost of the machine! Get it now! No strings attached. Send $1.*

BOOK SENT FREE IF YOU BUY MACHINE. $1 REFUNDED IF YOU BUY LATER.

GENERAL ENGINES CO.
DEPT. S-47 ROUTE 130, THOROFARE, N. J.

BARGAINS

LISTS EVERY MONTH HUNDREDS OF TERRIFIC BUYS IN—

● BANKRUPT, Closeout, Surplus Goods ● New & UNUSUAL items. ● WHOLESALE ITEMS ● BELOW WHOLESALE ● Sources of 100,000 items wholesale. ● Rare Money-Makers opportunities.

HUNDREDS of TERRIFIC offers in Toys, Books, Household goods, Jewelry, Greeting cards, etc.! . . . SAMPLE BARGAINS— ● Famous $16.00 Perfume at 66c. ● 50c boxes Everyday, Xmas cards, 7c box. ● $1.00 toys, 29c ● $1.95 silk ties, 12½c ● Pencils, 49c gross ● $17.50 talking dolls at $7.50! PLUS MANY, MANY OTHERS!!
BIG SPECIAL ISSUE NOW OUT! Subscribe NOW! BARGAINS let you BUY BETTER, CHEAPER, NEWER things for yourself or for resale at TREMENDOUS PROFITS.

$1.00 Buys 6 Big issues—1 Yr. $2.00. Reg. Price $3.00 year. Spec. Limited time offer to get 10,000 new subscribers. **The only magazine of its kind published!**

TOWER PRESS INC., P. O. Box 591-SK, Lynn, Mass.

POWER OF WORDS

If YOU want to be—

An interesting conversationalist . . .
Good speaker before groups . . .
Forceful in use of words.
Confident and correct in the use of written and spoken English

find out about Functional Training in English. Amazing booklet, THE POWER OF WORDS, is yours free. Write for it today.

PRINCIPLE INSTRUCTION CENTER, Dept. D-7
2956 Peterson Ave., Chicago 45, Ill.

Used perfect **HOIST and WINCH**

Eliminates Backbreaking Ordeals . . . Small but Mighty. Made to be used on B-29's for lifting bombs. 2,000 lb. capacity. Wgt. 16 lb. Perfect for lifting or moving loads in trailers or auto trucks, tractors, on any other movable machinery. Fine for garages, implement stores, warehouses, assembly lines, contractors and many other uses. Original cost, Appr. $200. Our price FOB KC . . . **$24.50.** Satisfaction guaranteed . . . Mounting Bracket . . . $4.50 extra

National Surplus Sales Co.
1812 Charlotte Kansas City, Mo.

RUPTURED?

NEW LASTING RELIEF

ENJOY NEW FREEDOM of action, peace of mind and comfort at work or play. Proven, patented MILLER holds your rupture back Day and Night—will bring you lasting relief. For free facts in plain wrapper, send name and address to: **FRED B. MILLER, Manufacturer, Dept. 3-D, Hagerstown, Maryland.**

Entirely Different

FREE!

EISENHOWER, ROOSEVELT, LINCOLN or WASHINGTON

Your choice of one of these lovely unused postage stamps from Grace Kelly's Monaco **PLUS** a Grace Kelly Wedding stamp **FREE** with your order for a **QUEEN ELIZABETH CORONATION** or **UNITED NATIONS** First Day Cover at 50¢ each—**both** covers for only 85¢. These historical items are scarce and will make wonderful additions to your collection. Send for Free lists.

K. M. WALSH Box 308 TUCKAHOE, N. Y.

GET LATEST OFFICIAL AIRCRAFT PHOTOS

SPECIAL INTRODUCTORY OFFER!
1. 4 3½x5 photos, world's fastest Jets.
2. 4 3½x5 World War II planes.
3. 4 3½x5 of Rockets, Missiles.
4. 1 8x10 Boeing B-52 Jet Bomber.
5. 1 8x10 Lockheed F-104A Starfighter.

Only 25¢ a set.
Send $1 for all 5. ($2 value)
Illust. Cat. with order. Money back guar

AVIATION PHOTO EXCHANGE DEPT. GP BOX 75064, LOS ANGELES 5, CALIFORNIA

Child's REAL *Auto*

Lots of fun but complete safety when children drive the new HACKNEY auto! Speeds as low as 2 MPH for little folks. 2-HP gas engine gives up to 35 miles on single filling of tank. Comfortable, Safe, Sturdy! Easy to drive. DEALER INQUIRIES INVITED. For full information write—

Gordon W. Morton Co. P. O. Box 5144 Greensboro, N. C.

INSURED TIRE SERVICE POPULAR BRANDS

SPECIAL! Deduct 10% on orders for Two or More used tires

FREE INSURANCE POLICY given with each used tire sold. We guarantee the amount of service you pay for.

NOWHERE CAN SUCH QUALITY BE FOUND AT SUCH LOW PRICE!

YOU CAN'T LOSE!!

Super Quality — Rugged Performance — 6 Months Insured Service							
600x16	$3.65	670x15	$3.95	700x16	$4.45	760x16	$4.75
650x15	3.85	670x16	4.05	710x15	4.35	820x15	4.95
650x16	4.25	700x15	3.95	760x15	4.45	550x17	4.65

Supreme Quality—Nothing Finer—12 Months Insured Service							
600x16	$5.25	475x19	$5.45	700x15(6)	$10.45	700x20	$12.50
600x16(6)	6.75	640x15	4.95	750x16(8)	15.95	750x20(8)	15.50
650x16	5.75	670x15	5.35	700x17	11.95	750x20(10)	17.50
650x16(6)	7.25	710x15	5.45	750x17	16.45	825x20	21.50
700x16	6.35	760x15	5.95	750x15	10.95	900x20	19.95
750x16(6)	8.45	800x15	6.35	30x5	11.25	1000x20	20.45
550x18	4.95	820x15	6.35	600x20	10.95	1100x20	21.25
550x17	4.75	550x15	5.35	650x20	11.75	1000x22	21.95
650x15	5.25	670x16	5.15	32x6(8)	11.95	1100x22	22.75
700x18	5.35	700x16(6)	10.25	32x6(10)	12.75	1100x24	25.95

Whitewalls $1.00 extra.

MIDLAND TIRE SALES

Speedy shipments on Mail Orders. F.O.B. Chicago. Insurance policy sent with each order. Deduct 10% on orders for 2 or more used tires. Send CHECK or MONEY ORDER.—No COD's.
3701 S. Normal, Dept. SS-54, Chicago 9, Ill.

Do FALSE TEETH Rock, Slide or Slip?

FASTEETH, an improved powder to be sprinkled on upper or lower plates, holds false teeth more firmly in place. Do not slide, slip or rock. No gummy, gooey, pasty taste or feeling. FASTEETH is **alkaline** (non-acid). Does not sour. Checks "plate odor" (denture breath). Get FASTEETH at any drug counter.

Build a Boat at ⅓ the Cost!

—with **CLEVELAND'S** full size, cut-to-shape boat patterns, detailed blueprints, and specifications. All classes and styles of modern Naval Architect-designed boats from 7½ to 38 feet. **BIG NEW 86-PAGE ILLUSTRATED CATALOG,** 50¢ (coin) "How to Build a Boat" booklet, $2.50.

14 ft. Runabout

24 ft. Cabin Cruiser

CLEVELAND BOAT BLUEPRINT CO.
Dept. B-177 Box 1651 Cleveland, Ohio

You'll have a "HE-MAN" BUILD

in just 6 weeks. Secret body-mold courses included FREE with exclusive

Dan Lurie Barbells

Scientific! Fastest, surest method known —beats all other training courses. Results guaranteed. Special low prices.
50 Lb. set $ 8.98 • 100 Lb. set $14.98
150 Lb. set $21.98 • 200 Lb. set $27.98
14¢ each add'l Lb. Prices F.O.B. plant.
50% deposit required on all orders

DAN LURIE BARBELL CO.
52 S-4 Bristol Street, Dept. 770-DB'klyn 12, N.Y.

LEFAX TECHNICAL DATA BOOKS

POCKET SIZE • LOOSE LEAF

Printed on loose leaf, 6 hole, 6¾"x3¾" bond paper, each book contains about 140 pages of technical data, condensed, accurate, essential, for engineer, technical worker, student, business man. **$1.25 each**

Architecture	Surveying	Mech'l Drawing	Metallurgy
Home Heating	Surveying Tables	Machine Design	Hydraulics
Illumination	Highway Eng'g.	Machinist's Data	Radio
Electrician's Data	General Math	Mech. of Materials	Television & FM
Builder's Data	Math Tables	Pwr. Trans. Mach.	Electricity, AC
Lumber Data	Physics	Therms. Tbls. & Charts	Electricity, DC
Air Conditioning	Trig-Log Tables	Phys. & Therms. Data	AC Motors, Gens.
Building Constr.	Gen'l Chemistry	Conversion Tbls.	Welding Data
Reinf. Concrete	Chemical Tables		Transformers, Relays & Meters
Piping Data	Analytic Chem.		

Write for FREE catalog (2000 listings). See how helpful LEFAX can be to you. Send $1.25 book, or $6 for any five books to

LEFAX PUBLISHERS, Dept. PS-47, PHILADELPHIA 7, PA.

FREE! 1957 ALLIED ELECTRONIC SUPPLY CATALOG

356 value-packed pages

SAVE ON EVERYTHING IN ELECTRONICS

WORLD'S LARGEST STOCKS

Everything for Experimenters, Builders & Amateurs, Servicemen, Engineers & Hi-Fi Hobbyists

Send for ALLIED's money-saving guide to *everything* in Radio, Hi-Fi and Electronics! Select from the world's largest stocks: High Fidelity systems and components: latest builders' kits (see the famous KNIGHT-KIT line); recorders and phono equipment; TV tubes, antennas, accessories; Amateur station equipment; P.A. Systems; test instruments; industrial electronic supplies—plus *everything* in parts, tubes, transistors, tools and books. Get more for your money—send for your FREE 1957 ALLIED Catalog!

Everything in Electronics from One Reliable Source
OUR 36TH YEAR

Send for FREE CATALOG

ALLIED RADIO

ALLIED RADIO CORP., Dept. 7-D-7
100 N. Western Ave., Chicago 80, Ill.

☐ Rush FREE 1957 ALLIED 356-Page Catalog

Name_____
Address_____
City_____ Zone____ State____

"How To Buy A New Car"

16-page bonus booklet in May Popular Science

WITH spring coming on, the lure of a flashy new '57 car becomes nigh irresistible. But hold on, friend, before you get hooked. May POPULAR SCIENCE brings you a 16-page "clip-'n-save" booklet that can well save you hundreds of dollars on your next car purchase. This bonus booklet points out that, while most auto dealers are honest, the few bad actors can clip you in more ways than you ever thought possible. Here are some of the vitally important points the booklet covers: **Which dealer gives you the better buy—big-volume man or small local dealer? Which month is the best for buying? What should you look for when making a trade-in deal? How should your contract or sales agreement read? How about accessories—should you buy them from dealer or from auto-supply houses? How about financing—through dealer? Banks? Finance companies? How can you get the best insurance deal? What kind of advertising should you be suspicious of? What are some of the sharp practices inside the showroom?** And there's plenty more in this valuable guide. Read it over carefully. Clip-'n-save it for your next car purchase. Besides possibly saving you a lump of cash, the booklet will give you a million dollars' worth of peace of mind when you drive your new buggy home. You'll *know* that you got a square deal.

ALSO IN MAY POPULAR SCIENCE
HOW TO BUY AUTOMOBILE TIRES

Which are the three best months of the year to buy new tires? What kind do you need for *your* kind of driving? Rayons? Nylons? Tubeless or tubed? What kind of tread—cross-slit, "steel treads"? What should you know about "inner tires" and self-sealers? How much should you get for your old tires on a trade-in? Get all the answers in May POPULAR SCIENCE.

ALSO IN MAY POPULAR SCIENCE
WHY YOU'D BETTER HEED THE SPEED LAWS

PS reporter Harry Walton reports on the exciting work of state troopers and the specialized equipment they use to run down speeders. You'll find out why you can't outrace the law, how a police car's motor and chassis differ from stock motors and chassis, how airplanes and radio are used, and what to do when the law says, "Pull over, buddy." For the full, informative story, see May POPULAR SCIENCE.

ALSO IN MAY POPULAR SCIENCE
THE STORY ON CAR AIR CONDITIONERS

The story is BIG! Prices on auto air conditioners have dropped as much as $200 in the last four years—sales may go to half a million in '57! Full report, complete with buyer's specifications chart, will reveal prices, cooling capacity, cool-down time, and other features of air conditioners for *all makes of cars!* Get the full story in May POPULAR SCIENCE.

ALSO IN MAY POPULAR SCIENCE
WHICH DRIVEWAY FOR YOU?

Whether you plan to build your own driveway, have a contractor do the job, or save money by doing part of the work yourself, here's everything you should know about asphalt, gravel and concrete driveways. Learn how to design the best driveway for your needs, how to choose materials, estimate costs. See what's involved in turn-arounds and circular driveways, in resurfacing your present driveway, and in many other driveway projects. It's all in a big, six-page feature in May POPULAR SCIENCE.

Read May Popular Science—At all newsstands, soon!

LEARN MEAT CUTTING AT NATIONAL

Pay After Graduation

The steady dependable trade of Meat Cutting taught easily in 8 short weeks. YOU LEARN BY DOING under actual meat market conditions in big modern school at Toledo.

For beginners or men with experience. Get a profitable store of your own. Remember, PEOPLE MUST EAT! Big pay jobs. Free employment help. Thousands of successful graduates.

Buying, cutting, percentage, pricing, advertising, selling, etc. A complete retail meat education. National School established 35 years. Get National training NOW. Pay your tuition in easy weekly payments after you graduate. Send coupon for FREE 52 page school catalog — TODAY. G.I. approved.

National School of Meat Cutting, Inc.
Dept. S1-Q Toledo 4 Ohio

Send me your FREE school catalog on National Training at Toledo in Meat Cutting, Meat Merchandising and Self Service Meats. No obligation. No salesman will call.

Name ..... Age .....

Address .....

City ..... State .....

Approved for training Korean Veterans

NEW!

BUILD MUSCLES & HEALTH with BODY BUILDER

Only $1.00 Postpaid

This new Chest Pull Body Builder develops powerful he-man muscles F-A-S-T. Ideal for the beginner to give him a real start in championship muscularity and perfect for the more advanced bodybuilder to combine with his regular training for faster, all around muscle growth. Body Builder is wonderful for developing massive arms, shoulders, chest and back. Mail your order today. Only $1.00 postpaid. No C.O.D.

MEDFORD PRODUCTS, Inc.
Dept. P.S.4, P.O. Box 39, Bethpage, New York

New! VEST POCKET COMPUTER

The Functionometer saves hours of mathematical work — gives you Sine, Cosine, etc. without any computation. All degrees . . . any degree of the circle. Fast, easy to use, a sure-fire short cut. Just set the arrow on degree desired . . . Funtionometer does the rest! 3½" in diam. — fits in shirt pocket. Only $1.95. Send check or money order today.

C. & J. SERVICE 1005 CENTRAL TOWER YOUNGSTOWN 3, OHIO

RHEUMATISM

NEURITIS • SCIATICA • LUMBAGO • ARTHRITIS

Why continue to suffer agonizing pains when usual remedies have failed. Learn how thousands have been successfully treated by an amazing new method which is fully explained in our New FREE Book. Don't wait. Write today. No obligation.

EXCELSIOR INSTITUTE, Dept. CB501 Excelsior Spgs., Mo.

BE A CLAIM INVESTIGATOR

INVESTIGATE ACCIDENTS! Many earning $750 to $1000 a month. Thousands of insurance companies, airlines, steamship lines and Government Offices need Claim Investigators. Also big opportunities for your own spare time business. We train you at home. National Placement Service FREE of extra charge. Bill King writes: "Your course has paid off for me with large earnings. You can quote me—your Adjuster Training Course is worth many times the cost." Write TODAY for FREE book.

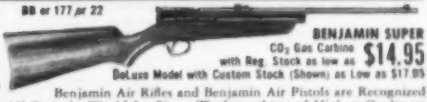
UNIVERSAL SCHOOLS
University Park, Dept. PS-4, Box 8202, Dallas 5, Texas

KEEP YOUR... on BENJAMIN for HIGH H[illegible]C COMP

"First in POWER and ACCURACY"

AIR GUNS & CO_2 GAS GUNS—Top Quality at LOWEST PRICES!

BB — BB or 177 or 22



BENJAMIN SUPER
CO_2 Gas Carbine with Reg. Stock as low as **$14.95**
DeLuxe Model with Custom Stock (Shown) as Low as $17.95

Benjamin Air Rifles and Benjamin Air Pistols are Recognized All Over the World for Finest Workmanship and Highest Quality at Lowest Prices. Adjustable Power with Amazing Optimum Force. **Fully Guaranteed — Safe — Accurate — Economical.** Easy to Use anywhere — 12 Models for Target and Small Game BB or 177 or 22.

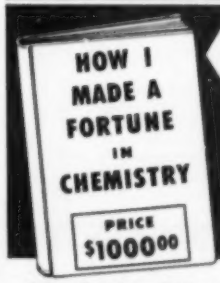
All Models Benjamin CO_2 Carbine Gas Rifles and Benjamin CO_2 Rocket Gas Pistols Use Standard Size CO_2 Cartridges (available everywhere). 2 Stage **Hi-LO** Jet Power — **High** for Small Game — **Low** for Target — Up to **50 Shots** from each Cartridge. **No Pumping — Safe — Accurate — Economical — Non Toxic** — 12 Models BB or 177 or 22.

FREE! Catalog All Models Benjamin Air Guns & CO_2 Guns & Supplies. Also, Money-Saving Offer on Hunting & Fishing Accessories.

Send Free Gun Catalog and Special Offer!

BENJAMIN AIR RIFLE CO. MAIL TODAY!
852 MARION ST., ST. LOUIS 4, MO., U.S.A.

Name _____
Address _____
City _____ State _____



The price of this book is $1000.00

IT CAN BE YOURS FREE!

NOW, for the first time published, the exact details, complete formulas and methods—nothing omitted! The author reveals how he made a **fortune** in Chemistry; the whole simple truth! Over a million dollars in sales in 6 years without EVER LEAVING HOME! The ideas in this unusual book may change the course of your entire life, as they did his! No special talent, knowledge, equipment or skill required! The author is handicapped; that's why his achievements can be duplicated and bettered by those who are not! Write for free details how you can acquire this precious book **FREE!** Only a limited number of these valuable books will be given away, so act NOW! If you are also interested in earning a diploma in Chemistry through HOME STUDY, ask for our **Catalog of Chemistry Courses!**

NATIONAL SCHOOL OF CHEMISTRY
P. O. Box 806-B Redwood City, Calif.

Dr. Grabow
PRE-SMOKED PIPES

Cool, sweet and mild from the first puff. No breaking-in because they're mechanically pre-smoked.

Imported briar

Regal $2.50

other Dr. Grabows from $1.50 to $10

trademark of quality

For informative booklet write:
Dr. Grabow Pipe Co., Greensboro, N.C.

Some make more, some less; **T. THORN reports:**

$690 gross in single MONTH IN MY OWN BUSINESS!

Start your own business!

Here's YOUR chance to start a money-making, year-'round business of your own and make the success you've dreamed about. R. O. Donnley took in $40 in seven hours. O. W. Ware landed a $750 hotel job. J. S. Corbit grossed $279.50 his first month. Homes, hotels, offices, clubs, offer you big profit possibilities. Auto upholstery also.

NO SHOP OR OFFICE NECESSARY. You clean furniture on customers' premises. No hauling. No high rents. Supplies inexpensive; operate from your home. What you take in is mostly profit.

● If you want to be your own boss—free from layoffs, strikes and bosses, we will help you to start and succeed. Don't delay . . . read the facts, then decide for yourself.

MAIL COUPON TODAY FOR FREE BOOK

VON SCHRADER MFG. CO.
411 "D" Pl., Racine, Wisconsin

Without obligation rush your **FREE** booklet about how I can start my own permanent, profitable electric Upholstery Cleaning business.

Name _____

Address _____

City _____ Zone ____ State _____

Learn Facts About Colitis and Piles

FREE BOOK Explains Causes, Effects and Treatment

Learn about Colon troubles, Stomach conditions, Piles and other rectal conditions. Causes, effects and treatment. 130-page book sent FREE. **McCleary Clinic and Hospital, 471 Elms Blvd., Excelsior Springs 4, Mo.**

NOW NO ONE CAN KEEP A SECRET FROM YOU! 20x-40x-60x **TELESCOPE** only $2.99 postpaid

Amaze your friends... See what they're doing—without being seen!

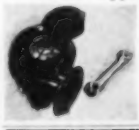
Special: Order now, get free carrying case.

Money back guarantee. Send cash, check or money order:

3-range all metal telescope magnifies up to 60 power. Watch ball games, look at the moon, stars, animals, distant buildings...up close. Bright aluminum tube, made for long use. Good on hikes, camping trips, can use either 20x, 40x, or 60x power instantly. Variable focus eyepiece. No assembling, ready-to-use, no special instructions required.

I. J. STONE, Dept. T-A-4 • 1816 Oak St. • Santa Monica, Calif.

BLOWER FAN • High Velocity • Easy Installation
only $15.95 ppd. Dog Bone Wrench with every order



Our fastest selling multi-purpose blower, widely used for exhausting, cooling forced drafts, dryers, circulating air, dark rooms, drying rooms, etc. Quiet operation, continuous duty, sturdy, steel housing. $15.95 ppd. Double blower fan similar to above $19.95 ppd. Do-it-yourself window and attic fan kits all sizes. Send for price list.

Dog Bone Wrench only 99¢ ppd.

JOHNSON SUPPLY COMPANY, DESK 2, 2611 Harriet Ave., Minneapolis 8, Minn.

HYDRAULIC JACK REPAIRS

Earn While You Learn at Home

Millions of jacks in gas & auto-service stations, truckers, body-shops, riggers, factories need servicing. We show you HOW—easy step by step directions—what tools to use. EARN UP TO $5 an hour, in spare time, in your own basement or garage. Start your own business NOW. Write for pamphlet 2PS4 & free bonus offer.

Institute of Hydraulic Jack Repair

P. O. Box 50 Bloomfield, N.J.

End Extension Cord Problems!

"HANDYREEL"

FOR ELEC. EXTENSION CORDS

Hundreds of Uses in Home, Shop, Farm, etc.

Reel stays at source of power. Draw one ft. or 500 ft. Handles light or heavy duty motors. Saves time! Every user of power tools will appreciate one. 12" W x 12½" H. Send check or M.O. to:

7.95 POST-PAID

LAKESHORE PROD. Woodinville, Wash.

GIANT BALLOONS

—3 for $1.25

Surplus US Govt. (New overage) Neoprene weather target balloons.

FOR FUN in the backyard; at parties, picnics, etc!

FOR ADVERTISING—Attracts crowds to civic events, business openings, trade shows, fairs.

Paint on sales message, seen for miles!

FOR PROMS—Makes any dance more festive. Ideal for high school or college affairs!

Approx. inflated sizes

3 ft. dia. 49c ea. (**SPECIAL!** 3 for $1.25)
5 ft. dia. 99c ea. (**SAVE!** 3 for $2.75)

Postage paid on prepaid orders. Calif. res. add sales tax.

VOLUME SALES CO., War Assets Division
3930 Sunset Blvd., Dept. PS-457, Los Angeles 29, Calif.

OUR AD HAS BEEN IN THIS MAGAZINE LONGER THAN ANY OTHER TIRE CO., NEARLY EVERYONE BUYS FROM STANDARD.
50 Years of Combined family experience in High Quality tires.
"We Have No Rent to Pay." That is Why We Can Undersell All Competition.

23 YEARS AT THIS ADDRESS
TUBE FREE WITH EVERY PASSENGER TIRE

Our entire stock of very slightly worn EXTRA MILEAGE TOP GRADE Tires. (Written Insurance Guarantee). SEND AD

EVERYBODY MAY DEDUCT **10% off** ON EVERY TIRE

FREE if you buy 2 or more Passenger 4-ply tires, WE GIVE ONE tire FREE, on each order. Does not include W.W. or Truck Tires.

WHITE WALLS $1.00 EXTRA—12 MOS. WRITTEN GUARANTEE

600-16	$5	475-19	$5.38	700-15(6)	$8.75	700-20	$11.95
600-16(6)	6.45	640-15	4.95	750-16(8)	10.25	750-20(10)	14.95
650-16	5.45	670-15	5.25	700-17	10.85	750-20(8)	10.95
650-16(6)	6.45	710-15	5.35	750-17	12.75	825-20	18.55
700-16	6.25	760-15	5.45	600-20	9.65	900-20	18.75
750-16(6)	7.45	800-15	5.75	650-20	10.75	1000-20	17.95
550-17	4.75	820-15	5.75	32x6(8)	10.35	1100-20	17.95
650-15	5.25	670-16	5.65	32x6(10)	12.35	1000-22	20.95
700-15	5.35	700-16(6)	7.75	750-15	11.95	1110-22	18.55

("EXTRA SPECIAL" Fully Guaranteed all size 4-ply pass. FREE TIRE with 2 or more of these.—W. W. $1.00 Extra. Factory Tested Tube given. GIANT TIRE SALE. **$7.75**

Thousands of tires shipped all over the U.S.A. All tires shipped F.O.B. Phila. Send Check or M.O. with this ad. Dept. S. No C.O.D.

STANDARD 834 N. Broad St., Philadelphia 30, Pa.

make your own *Gems* **32.50** F.O.B.

The Gem Maker comes complete with all necessary equipment, including a super-charged diamond blade for sawing, and all wheels for grinding, shaping and polishing; also complete instructions. The complete equipment as shown less motor and belt, for only $32.50, f.o.b., Burlington, Wisconsin. Write today for information and literature.

B & I MANUFACTURING CO.
Dept.S Burlington, Wis.

EXCLUSIVE DOUBLE-BEARING
HEAVY DUTY PUMPS

IRRIGATE • DRAIN • CIRCULATE • SPRAY

Up to 7,500 GPH; 1,000 GPH 60' high; or 3,000 GPH from 25' well. Use 1/4 to 1 HP motor. 1 1/4" inlet - 1" outlet. Stainless shaft. TYPE X—2 oil-less bronze bearings. Won't rust. **$10.95**
TYPE XB—Ball bearing model **$12.95**
Best for belt drives . . . . . .
Postpaid if cash with order.
Don't delay—send for yours today!
MONEY BACK GUARANTEE
Center . . . . . Sizes
LABAWCO PUMPS, Belle Mead 4, N. J.

$2.95 OR 2 FOR $5.00

With 50 ft. of wire and slightly used battery.

TESTED AND GUARANTEED

Write for free list on all types of telephones. Shipments F.O.B. Simpson, Pa.

TELEPHONE ENGINEERING CO.
Dept. 4A7 Simpson, Pa.

Now!

TEST YOUR OWN TV-RADIO TUBES!

EVEN THE PICTURE TUBE

Checks fuses, appliances, etc. Easy, safe to use. Insert tube in socket "red light instantly indicates if tube needs replacement. Rugged metal case (not plastic). AC or DC. One service call saved pays for tester. Only 3.95 ppd. or C.O.D. plus charges. DeLuxe model 4.95. Instructions. 5-yr. guarantee.
GEIGER ENGINEERING CORP., Dept. BC-101, 6349 N. Western Ave., Chicago, Ill.

WARN HUBS ON YOUR **'Jeep'**

STOP FRONT DRIVE WEAR

Over 100,000 Warn Hubs are now in use, *proof* that free-wheeling 2-w.d. with Warn Hubs means big savings in gear, engine, tire wear, gas, *plus* more pep, performance, power in high and easier steering. Now, with Warn Lock-O-matics, you have economical, drag-free 2-w.d. or tractive 4-w.d. *automatically, as you shift!* Ask your local 4-w.d. dealer to install Warn Lock-O-matic or Locking Hubs today. Fully guaranteed. Write for free literature.

Models for all 4-w.d. in the trade

WARN MFG. CO., Riverton Box 606484, Seattle 88, Wn.

Profitable reading for ambitious engineers!

Honeywell Aero's free booklet, "Curve of Opportunity", gives you a quick rundown of the outstanding career opportunities and some of the exciting aeronautical projects now in progress in this expanding Honeywell Division.

To get it, write:
Bruce D. Wood, Tech. Director, Dept. TA26 B, Minneapolis-Honeywell, 1433 Stinson Blvd. N.E., Minneapolis 13, Minn.

MINNEAPOLIS **Honeywell**
Aeronautical Division

PREPARE FOR BETTER JOB, BIGGER PAY IN SPARE TIME AT HOME

Today, choose the job you want—and prepare for it in time you might otherwise waste. Or if you are already in the work you like best, start training now for quicker promotion and increased pay. During the past 60 years AMERICAN SCHOOL has helped ambitious people to reach higher goals. Check subject that interests you and mail coupon for full information.

AMERICAN SCHOOL, Dept. G446, Drexel at 58th, Chicago 37, Ill.
Without obligation, please send FREE and postpaid, full particulars about the subject checked below:

☐ Accounting
☐ Apprenticeship Courses
☐ Architecture & Building
☐ Automotive Technician
☐ Better Foremanship
☐ Blueprint Reading
☐ Bookkeeping
☐ Business Management
☐ Civil Engineering
☐ Contracting
☐ Diesel Technician
☐ Drafting—Building Trades
☐ Drafting—Machine Trades
☐ Electrical Engineering
☐ Electricity—Practical
☐ Electronics—Industrial
☐ HIGH SCHOOL COURSES
☐ Machinists
☐ Mechanical Engineering
☐ Mechanical Technology
☐ Metalworking Courses
☐ Plumbing—Practical
☐ Private Secretary
☐ Retail Merchandising
☐ Salesmanship—Outside
☐ Sheet Metal Work
☐ Tool Making

NAME . . . . . OCCUPATION . . . . . .
HOME ADDRESS . . . . . AGE . . . . . .
CITY . . . . . STATE . . . . . .
Canadians: Write American School, Dept. G446, 6083 Sherbrooke St. W., Montreal

MAIL COUPON NOW

"We'll be using them for years...

...that's why we pick the Brand that's made a Name for itself!"

EVERYTHING that goes into a new house takes a big bite out of the family budget. And it's all too true that you have to live with mistakes you make in buying . . . whether they be appliances, furniture, food, clothing or whatever. So buy brands that have made a name for themselves. You're bound to be satisfied.

FOUR WAYS BRAND NAMES SATISFY YOU MOST

1. BUY WITH TRUST!
Spend *confidently* on known quality. Brand Names wear best, work best, taste best, are best.

2. SHOP WITH EASE!
Spend *efficiently* on proved value. Brand Names save time "puzzling" over labels, models, prices, etc.

3. ENJOY MORE CHOICE!
Spend *shrewdly* among widest selections. Brand Names offer the most in sizes, types, colors, flavors, etc.

4. GET THE "LATEST"!
Spend *smartly* on up-to-date products. Brand Names keep improving, modernizing, introducing new things.

MANUFACTURER DEALER CUSTOMER

Advertisers in this magazine are good names to know. They're proud of their brands 'cause they satisfy so.

BRAND NAMES FOUNDATION, INC. • 37 Fifth Avenue • New York 16, N. Y.

New HOME-IMPORT BUSINESS!

Men — Women. We show you how to import big-profit items at amazing low foreign prices (examples at left). Your home is your office. Get *list of 157 Imports FREE!* Full or spare time business by Mail Order. Or take volume orders from stores. Import jewelry, clothing, sporting goods, hardware, etc. **NO EXPERIENCE OR INVESTMENT IN PRODUCTS NEEDED.** Without obligation send today for *complete details* and list of 157 imports FREE! Air mail reaches us over night. THE MELLINGER CO., 1717 Westwood Boulevard, Dept. G-244, Los Angeles 24, California.

Clocks 65¢ in Germany—$5 value in U.S.A.

GET LOADS OF MAIL!
Get Offers, Catalogs, magazines, folders Galore!

Want your mail box stuffed with interesting, attractive offers, catalogs, samples, magazines, etc? NO OBLIGATION FOR YOU TO BUY ANYTHING! We'll list your name and address with 1000 firms for mail for just $1.00. Rush $1.00 & name and address TODAY!

Tower Press, Inc. P.O. Box 270 Lynn 240, Mass.

TERMITES IN YOUR HOUSE? GET RID OF THEM YOURSELF!

DON'T PAY $300.00 AND UP TO ERADICATE TERMITES FROM YOUR HOME OR PREVENT INFESTATION. DO IT YOURSELF IN ONE AFTERNOON. EASILY! QUICKLY! INEXPENSIVELY WITH "TERM-OUT"! SEND STAMP FOR HANDBOOK

COMPASS RESEARCH
4700-B CLAIRTON BLVD., PITTSBURGH 36, PA.

FIX home & car APPLIANCES YOURSELF

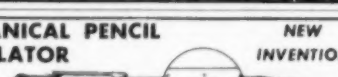
NEW! EICO REDI-TESTER
KIT $12.95 Factory-wired $15.95

Multi-range ac/dc voltmeter, ammeter, ohmmeter, wattmeter, leakage checker. Locates defects in appliances, air-conditioning, furnace control, TV, radio, car batteries, generators, etc. Easy step-by-step instruction book. Send Check or M.O., specify Kit or Wired. Or write for neighborhood distributor's name & FREE catalog PS-4 describing EICO's 50 professional Kits & Instruments.

Electronic Instrument Co., Inc. 84 Withers St., Bklyn 11, N. Y.

MECHANICAL PENCIL CALCULATOR

NEW INVENTION



MATH-WIZ pencil calculator gives answers automatically to addition, multiplication and square root problems. (Indirect subtraction and division.) Easy to operate, comes in gold anodized aluminum casing. Useful gift for students, engineers, draftsmen and in all industry. Only $2.29 postpaid. No C.O.D.

Not a Slide Rule

JACK WEISER, 1233 S. Fairfax Ave., Dept. S, Los Angeles 19, Calif.

NEW FALSE PLATE FROM YOUR OLD ONE IN 18 HOURS

AS LOW AS $14.95

Send us your old broken, cracked or loose plates and we'll transform them into new lightweight wonder plastic plates. NO IMPRESSIONS needed with our revolutionary method. We use your own old plates. We remake them completely in only 18 hours. Missing teeth carefully matched and replaced. We GUARANTEE TO SATISFY YOU OR REFUND YOUR MONEY.

SEND NO MONEY—Send us your name today and we'll RUSH COMPLETE DETAILS. Begin to enjoy life right now. Clip this Ad; save it and send for free facts.

CHICAGO DENTAL PLATE LABORATORY • Dept. PS457
30 N. Dearborn St. • Suite 714 • Chicago 2, Ill.

ENGINEERED PROTECTION AT THE "POINT OF THRUST"

(Patents No. 2702996 - 2761295)

A neoprene sealing sleeve that keeps lubricant in the transmission . . . keeps dirt out; prevents metal scoring, stops lubricant loss, ends costly repairs. The Davis Ball Boot is easily installed without special tools . . . has a built-in bellows that absorbs thrust . . . will last for the life of your car and give unfailing protection every mile you drive!

Model DBB501—time-tested and unconditionally guaranteed—for 1937-1954 Chevrolets (standard and Powerglide transmissions), completely encloses the ball housing coupling. It seals at both ends, and is packaged with a tempered neoprene deflector that prevents loss of transmission lubricant to the rear end. Other models protect the vital "point of thrust" by keeping road grit from the drive shaft extension. Don't risk transmission failure. Don't tolerate lubricant loss and frequent repair bills. Order a Davis Ball Boot today! Models for passenger cars and pick-ups, all transmissions, plus GMC pick-ups.

DAVIS BALL BOOT CO., INC., 2301 Yale St., Houston, Tex.
Rush postpaid the following Davis Ball Boot:

- ☐ For 1937-1954 Chevrolet @ $4.85 each.
- ☐ For 1955-1957 Chevrolet @ $1.45 each.
- ☐ For 1949-1957 Ford @ $1.45 each.
- ☐ Check ☐ Money Order Enclosed ☐ Send Literature

NAME _____
ADDRESS _____
CITY _____ STATE _____

DAVIS BALL BOOT CO., INC.
2301 YALE STREET, HOUSTON 8, TEXAS

WHAM-O Sports are FUN!

FREE FOLDER of other products

Satisfaction guaranteed. At sports dealers or send:

WAMO MFG CO., Box D 93, San Gabriel, Calif.

WORLD'S GREATEST

CLASSIFIED

OPPORTUNITIES

Here are hundreds of opportunities offered especially to the readers of Popular Science Monthly. Read them. Answer them! You can make and save money.

POPULAR SCIENCE MONTHLY — 353 FOURTH AVE. — NEW YORK CITY 10

Classified Ads only $1.00 per word insertion, payable in advance. Minimum ad 10 words. To be included in June issue, copy should be in our office by April 25. No cancellations accepted after April 15. Address orders to O. K. Kelly, Classified Adv. Mgr.

1 AUTOMOBILES & MIDGET CARS

ARMY Surplus Jeeps, all makes, years, and conditions. Listings 50c, with photos 75c. Buckeye Sales, 80½ Sherman Ave., Mansfield, Ohio.

HUNDREDS of automobile catalogs—old, new and foreign; dealer books, glossy photographs, shop manuals; free motor magazines listed by non-profit organization. Write to get on free mailing list. Auto Maniacs, Inc., Stockbridge, Michigan.

AUTOMOBILE Fans. Get a list of more than 2700 different cars sold in America during the past 50 years. Brochure 24" by 38" suitable for framing. Makes a nice gift. Send $1.00, check or money order, and get your copy. No C.O.D. Please print name and address plainly. Miller Implement, Hiawatha, Kansas.

NEWS of Automotive products, plans, developments. Sample copy 10c. Laircraft, Box 5008-R, Detroit 35, Michigan.

WHOLESALE Appliances, Automobiles, Watches. Cadillac, $10,000 yearly. Strateway, 6228-Bn, Charlotte 7, North Carolina.

2 AUTO SUPPLIES & EQUIPMENT

SAVE money on Jeep and army truck parts. Large inventory. Catalogs for Jeep and G.M.C. owners. American Auto Parts Co., 1830 Locust, Kansas City, Missouri.

AUTO Accessory and Parts Catalog, 1957 edition—all new! 228 pages. Save up to 50%—75,000 items, including Hollywood accessories, hi-speed equipment, rebuilt engines, all parts and accessories for all cars and trucks! Hard-to-get parts! Send 25c (refundable). J. C. Whitney, 1919 PS Archer, Chicago 16, Illinois.

SPEED and Power Equipment. Hundreds of name brand items, 45 page fully illustrated catalog, 50c. Refunded on first purchase. Midwest Auto Specialties, Dept. J, 13907 Miles Avenue, Cleveland 5, Ohio.

TRIPLE protection for today's car, truck, tractor engines. New "Electric Reclaimo" filters, re-refines, stabilizes crankcase oil. Prevents destructive acid-sludge formation; makes oil changing unnecessary. Folder free. Reclaimo, 6251-P Touhy, Chicago 30.

SAVE on Parts, Accessories, Gadgets, Tools. Dress-up-Items not in stores. Giant 1957 Catalog—25c. (Refunded First Order.) Newhouse Automotive Industries, 5803-PS Beverly, Los Angeles 22, California.

FORD A and T parts? Try best source old car parts anywhere. Wisniewski, Milwaukee 7, Wisconsin.

REMOVE Carbon from inside engine for 8c. Formula 50c. Stern, Box 1191, San Bernardino, California.

SECRETLY Protect your car from thieves and Pilferers. Installed easily yourself in 30 minutes. Material and Instructions $2.00. Kogel's Magic Devices, 6751 Colbert, New Orleans 24, Louisiana.

PROTEX Stops Battery Corrosion. Install Protex Now, $1.98 pair. Pender, Box 243, Murray, Utah.

CARBON Removed from inside motors for 8¢. Formula 50¢. Formulas, 2210 Peoria Road, Springfield, Illinois.

USE THIS HANDY INDEX TO FIND WHAT YOU WANT

Advertising, Agencies for Advertisers ... 53
Agents Wanted ... 43
Antiques, Relics & Indian Goods ... 29
Artists Supplies ... 76
Authors Service ... 52
Auto Supplies & Equipment ... 2
Auto Trailers ... 3
Automobiles & Midget Cars ... 1
Aviation ... 5

Batteries, Generators, Etc. ... 8
Boats, Outboard Motors ... 11
Body-Building Courses, Jiu Jitsu, Etc. ... 12
Books & Magazines ... 23
Build It Yourself ... 66
Business Opportunities ... 37
Business Service, Information, Name Lists ... 50
Buy It Wholesale ... 38A

Cameras, Photo Supplies ... 34
Camping Equipment & Tents ... 16
Cartooning, Sign Painting, Chalk Talks ... 54
Chemistry & Physics ... 41
Claim Investigators ... 37A
Coins & Currency ... 26
Color Photo Finishing ... 32A
Contests ... 46

Detectives ... 47
Dogs, Birds, Hamsters & Pets ... 17

Earthworms & Frog Raising ... 18
Educational & Instruction ... 48
Electrical Supplies & Equipment ... 7
Engines, Motors, Etc. ... 10

Farms, Other Real Estate ... 19
Field Glasses, Telescopes ... 14
For Inventors ... 60
For Sale Miscellaneous ... 71
For the Home ... 69
Formulas, Plans, Etc. ... 39

Games & Entertainment ... 24A
Geiger Counters, Treasure Finders ... 77

Help Wanted ... 42
High-Grade Salesmen ... 44
Hobbies, Collections ... 31
Home Craftsman ... 65
Hypnotism ... 24

Inventions Wanted ... 61

Language Outfits ... 48

Machinery, Tool Supplies, Etc. ... 9
Magic Tricks, Puzzles, Etc. ... 25
Manufacturing ... 63
Minerals & Precious Stones ... 30
Miscellaneous ... 79
Models, Model Supplies ... 64
Moneymaking Opportunities ... 38
Motion Pictures, Slides, Sound Equip. ... 33
Motorcycles, Bicycles & Supplies ... 4
Music, Song Writers & Records ... 35

Of Interest To Women ... 70
Old Gold, Jewelry, Watches ... 67
Old Stamps Wanted ... 27

Patent Attorneys ... 59
Patents For Sale ... 62
Personal ... 80
Photo Finishing, Photocopies, Etc. ... 32
Plastics ... 40
Plays, Stories, Etc. ... 49
Poultry & Supplies ... 21
Printing, Multigraphing, Etc. ... 57
Printing Outfits, Supplies ... 58
Profitable Occupations ... 22

Radio, TV, Supplies & Equipment ... 36
Razor Blades, Shavers ... 74
Rubber Stamps & Office Supplies ... 56

Special Services ... 51
Sporting Goods, Guns, Fishing Tackle, Etc. ... 15
Stamp Collecting ... 28
Surveying Instruments ... 79A

Tattooing Supplies ... 75
Tobacco & Pipes ... 68
Trees, Shrubs, Roots & Herbs ... 20
Trigonometers ... 9A
Typewriters & Office Machines ... 55

Wanted to Buy ... 72
Watch Repairing ... 78
Wearing Apparel ... 73
Welding, Soldering ... 8
Wood Preservatives ... 65A

200% PROFIT selling 'No-Kro'. One Easy Application stops corrosion on Batteries and Cables. Lasts for years. Guaranteed. $1.00. Territories Open. No-Kro Company, Chanute, Kansas.

AUTO air-conditioner, easy "make it yourself" booklet, $1 postpaid. Highway Air Conditioning, 167PS West 22, New York.

RING-Valve Job while you drive, $6.00 postpaid. Safe! Proven! Guaranteed! Literature. Motaloy, Grantham 27, Pennsylvania.

YOU can save hundreds of dollars in operating your car. Information Free. James Products, 1625-50th Ave., Cicero, Illinois.

3 AUTO TRAILERS

CONSTRUCT lightweight non-canvas folding trailer. Accommodates five. Brochure 25c. Mebco, Box 25, RD 1, Havre de Grace, Maryland.

PICKUP Coach Blueprints $2.50. Literature 10¢. Comstock Trailers, Parsons, Kansas.

BUILD Expanding eight foot trailer. Accommodates five. Literature 10c. Framar Company, Wilmington, Massachusetts.

4 MOTORCYCLES, BICYCLES AND SUPPLIES

RECONDITIONED Motorcycles and motors. Chromium accessories. Complete stock Indian parts. Expert rebuilding. Fast service. Indian Motorcycle Sales, Kansas City 27, Missouri.

MIDGET racer $10. Motorscooter $15 less engines. Whizzer motorbike engine $7.50. Briggs $4. Maytag $3. Doodlebug $8 (mailorder only). Send 25c (35c for First Class mailing) for new 36-page, illustrated Directory-Catalog TE, listing these and hundreds of other bargains, homebuilders plans, parts, etc. Midget Motors Directory, Athens, Ohio.

NSU and BMW Motorcycles, 2 to 35 H.P., Singles and Twins. Chaindrive and Shaft-drive. Butler & Smith, P.O. B. 45, New York 24, New York.

SERVICYCLE $20.00; Whizzer Motorbike $25.00; Cushman motorscooter $25.00; midget auto $25.00. Rush 25c (35c first class mail) for new catalog #959 listing many other amazing bargains in motors, midget cars, motorscooters, motorbikes, construction plans. Associated, Box 534, Toledo, Ohio.

5 AVIATION

AVIATION Surplus Bargain Catalogue. One Dime. Box 22-PS-7, Thomasville, Pennsylvania.

AIRPLANE Photographs, Beautiful Large 14x17 Color Reproductions. Decorate Dens, etc. War Planes In Action. Six Assorted. Send $1.00. Jarvis, Box 126M, Bostonia, California.

TREMENDOUS Government Sales Now On—Buy Direct From Uncle Sam—Surplus Aircrafts; Fuselages; Accessories; Engines; Instruments; Electronics; Radiotelephones—Government Depot List and Procedure $1.00. Brody, Box 8-PSK, Sunnyside 4, New York.

HOMEBUILT Helicopter Handbook, $1.00. Urshan, Box 4332 N.P. Station, San Diego 4, California.

POPULAR SCIENCE OPPORTUNITIES

PROPELLERS, plans, supplies for airboats and snowplanes. Latest designs, prompt delivery. Catalog 25c. Banks-Maxwell, Box 3301G, Ft. Worth 5, Texas.

6 BATTERIES, GENERATORS, ETC.

EDISON Nickel Storage Batteries. Any voltage, any amperage. Unconditionally guaranteed. Power Plants, Generators, Motors. Literature. Hawley Smith Co., Croton Falls 2, New York.

7 ELECTRICAL SUPPLIES & EQUIPMENT

ELECTROPLATING equipment, anodes and solutions for all types of plating. Instructions. Assemble your own plater and save. Free Catalog. Ramyr, Dept. E-2, 1624 East First Street, Los Angeles 33, California.

LAMPS—Parts Catalog showing wiring instructions, 25c. Gyro Lamps, 5402B Clark, Chicago 40.

POWERFUL Magnetizer—Magnetizes Screwdrivers, etc. Instantly. Only $1.25 Postpaid. Kubiak, Box 62, County Line Road, Huntingdon Valley, Pennsylvania.

ELECTRIC Pencil; Engraves all Metals, $2.00. Beyer Mfg., 10511-C Springfield, Chicago 43.

ELECTRIC Motors. Home workshop, industry. Money back Guarantee. ½ h.p. $18.50, ¼—$22.00, 1—$28.00. Others ¼ to 50 h.p. Any speed, phase, voltage, cycles. Temps Motors, 70-24 Myrtle Avenue, Brooklyn 27, New York.

WRITE On Metal, Plans $1.00. Stamped Self-Addressed Envelope. Robert Yazowski, Boonville, New York.

LAMP parts Wholesale Thousands of items for repairing, converting. Catalog 25c. Brown Lamp, Box 305D, Clayton 5, Missouri.

8 WELDING, SOLDERING

"BUILD-Ur-Own" a.c. welder and a.c. power plant with a good used engine and low cost Hobart generator. Welds anywhere and supplies 5KW stand-by power for any emergency. Write Hobartweld, Box P-473, Troy, Ohio.

ACETYLENE Welding Outfits new $54.50; used $34.50; Arcwelders $56.50. Eagle Welding, Dept. 42, 5085 Broadway, Chicago 40, Illinois.

REVOLUTIONARY all purpose blow torch will solder, sweat, and do odd jobs. 2000° flame. Guaranteed. Send $2.98. Perreca, 3905 Pratt Avenue, Bronx 66, N. Y.

A. C. Welders, four sizes, lowest prices. Free Literature. Holgerson Co., Canton, Kansas.

WELDERS, 110/220. Welds ½". $39.50. Morris, 1070 Inner Drive, Schenectady, New York.

BUY welding supplies direct from manufacturer. Cable, welding rods, helmets, etc. Portable Arc-Welders and kits at tremendous savings. Free factory catalog! LeJay Mfg. Co., 2923 Emerson Ave. So., Minneapolis, Minnesota.

9 MACHINERY, TOOL SUPPLIES, ETC.

TOOL Bits, preground. Free list. Tool Craft Company, Dept. C1, Hackettstown, New Jersey.

ROLL barb and smooth wire with car or pickups. Total cost 50c to $5.00. Patent Pending. Plans $1.00. Box 825, Lawton, Oklahoma.

SPECIAL — The Mechanics Choice — 6 Magnetized Best Quality Tool Steel Heavy Duty Screwdrivers. Assorted From 3 to 11 inches. Packed to sell for $4.85. Now $2.50 Postpaid. Order From Victory Oil Co., Gladwin, Michigan.

MACHINISTS! New cut-off blade holder for tool post turrets. Free literature. Drage Engineering, 51-04 Junction Blvd., Elmhurst 73, New York.

DO You have solid carbide drills, router bits, mills, to sharpen? Parcel post drills, taps to Myers Sharpening Service, Northfield, Ohio.

MIXER: Kit uses Oil Drum. Easy assembly. Easily Portable. Less drum and motor: Chain Hook supported $29.85. With Special Standard $39.50. Nu-Way-Do Co., Newaygo, Michigan.

CAMPBELL Slot Gage. $6.95. Gages internal, external slot widths .060" to 3.00" (with micrometers). Enters 9/16" opening. Too; steel precision ground. Campbell Tools Company, 1424 Barclay Road, Springfield, Ohio.

9A TRIGONOMETERS

TRIANGLE problems? Solve with new, unique "Trigsle" trigonometer—set two slides, read answers direct. No figuring. Precision made. Practical. Only $4.85, postpaid if check enclosed. C.O.D.'s accepted. Satisfaction or money back. Free literature. Vanora Products, Dept. S-4, Box 8485, Kansas City 14, Missouri.

10 ENGINES, MOTORS, ETC.

REWIND Motors yourself. Complete instructions $1.00. Lewis Mfg., Howell 11, Michigan.

DIESEL Injector Parts Wanted GM71-110 Series. Mayer, 7120 Carnegie, Cleveland 3, Ohio.

WHOLESALE Catalog 10c. Outboards Motors, Motorbikes, Electric Tools. Loren Products, Danville, Illinois.

11 BOATS, OUTBOARD MOTORS

NEW, used, rebuilt marine motors. Marine conversions, fittings. Free Catalog. Stokes Marine Supply, Dept. 23, Coldwater, Mich.

SAVE Money. New, used outboard motor parts. Send wants. Stamp appreciated. Outboard Motor Mart, 229-S State, Boston 9, Massachusetts.

FREE big catalog: Boat Kits save ½ to ⅔ "factory built" prices. 8' through 18' outboards designed for amateur assembly. Trailers, Fiberglas, Hardware, Accessories. Luger, Dept. K4, 3404 Lyndale South, Minneapolis 8, Minnesota.

BOAT Plans—Full Size Patterns—Frame Kits. Modern Inboards and Outboards for amateur builders. Complete New Catalog 50c or specify requirements. Glen Marine, Box 568, Compton, California.

ALUMINUM Boats and Canoes. Quality aircraft-type design and construction. Safe, durable, beautiful. No maintenance. 100% boating pleasure. New 1957 Catalog Free. Grumman Boats, Inc., 3847 South, Marathon, New York.

MEYERS Aluminum Boat, Stable—Rigid—Seaworthy, America's Finest. Free Literature. Factory, Tecumseh, Michigan.

BOAT Covers and Tops. Free catalog. Barker Mfg. Company, 22 Main Street, Honeoye Falls, New York.

FIBERGLASS Boat Coverings, wholesale prices. Free literature, samples. Seifert's, Box 31X, DePere, Wisc.

MARINE conversions for Ford and Jeep engines. Catalog 25c. Lehman Manufacturing Co., 972A Broad St., Newark 2, N.J.

FIBER Glass—Buy Direct—Save 40%. Complete polyester and epoxy resin boat covering kits and supplies. Highest quality guaranteed. Send for prices and brochure. Marine Fiber Glass Corp., 6308 San Fernando Rd., Glendale 1, California.

OUTBOARD parts used, send model, serial. Smithfield Marine, Esmond 17, Rhode Island.

NEW! "How to Build Your Own Fiberglass Boats" and "How to Make Old Boats New with Fiberglass." Send 10c. Castolite, Marine Division, Dept. DM-102, Woodstock, Illinois.

,00 PLANS, Patterns, Kits. Catalog 50c. 2.5 H.P. Outboards $79.95! Marinecraft, Box 161-P, Brighton, Massachusetts.

FIBERGLASS Your Boat. Top Marine Grade Only. By Yard Or Kit. Ontario Fiberglass Co., Box 20, Ontario, New York.

FIBERGLAS boat coating. Plexiglas boat windshields—clear, blue, green tints. Wholesale-retail. Instructive information catalog—free! Gem-O'-Lite, 5529 Cahuenga, North Hollywood, California.

SWAMPED! Save Yourself And Your Boat—Install Styrofloat. Literature 25¢. Gel, Box 261, Union, New Jersey.

12 BODY-BUILDING COURSES, JIU JITSU & ATHLETIC EQUIPMENT

BUILD powerful arms, chest, shoulders! 22 exercises, $1. Fonsad, Box 601-C, 1100 Market, Wilmington 99, Delaware.

STRENGTH, Health, Muscles, gain, reduce. All you need is a rope! Free details. Ropercise, 4834-B Art St., San Diego 15, California.

4 MUSCLE Courses 25c. Fully Guaranteed. Sid's System, Southgate, California.

BIGGER Muscles, Faster! Seven Courses —35 Exercises $1.00. 30-Day-Money-Back Guarantee. Buckley, Box 638-C, North Miami, Florida.

BE Taller! Coach's "Inch-At-A-Time" system—$1.00, complete. Marty Snyder, Box 195-PB, Union City, New Jersey.

REDUCE or gain weight. $1.00. Results guaranteed. Frederick Stahl, Box 356, Stanhope, New Jersey.

BARBELLS: Sends 25¢ for booklet. Health, Strength, Physique. Reading Barbell Co., Reading, Pennsylvania.

POWERFUL Arms. Free Details. Ihle, 17 Wayne Court, Staten Island 10, New York.

BARBELLS, Dumbbells. Exercise equipment Courses. Free booklet. Good Barbell Co., Reading, Penna.

PUSHED around? Why take nonsense from Bullies. Give them the surprise of their lives. Easy when you know Police Jiu Jitsu. Complete fully illustrated course in one volume same as taught police and armed forces. Send $1 now for Police Jiu Jitsu postpaid. Satisfaction guaranteed. Books Publishing Company, Amityville 39, New York.

14 FIELD GLASSES, TELESCOPES

MICROSCOPE Catalog Free. Research Scientific Supplies, 60 Wall Street, New York 5.

FREE Catalogue! Thousands war surplus optical bargains. Lenses, Prisms, Telescopes, Binoculars, etc. Send $1.00 for 10 Lens Hobbyist Set and Project booklet. G. Jaegers, 691 West Merrick Road, Lynbrook, New York.

WAR Surplus bargains! Millions of lenses, instruments, telescopes, binoculars, components and complete line of astronomical telescope items. World's greatest optical market place! Send only $1.00 for beginner's 10-lens kit and big instruction booklet Stock 2-CN. Write for catalog-CN Free. Edmund Scientific Co., Barrington, New Jersey.

REFLECTOR Telescope Kits $7.25 (3") to $175.00 (12"). Mirrors, Cells, Focusing Mounts, Tripods, Eye Systems. Anything, everything in telescopes. Free Catalog. Also Ready to use telescopes from $25.00. Esco Products, Oakridge, New Jersey.

BINOCULARS, Riflescopes, etc. Exclusive models! Tremendous selection. $100,000.00 stock! Free 56 page illustrated, catalog. United, 9043 S. Western, A-3916, Chicago 20. Dealers Wanted.

DYNASCOPE—Sensational New Reflector Telescope. Send for details. Criterion Company, Dept D8-36, Hartford, Connecticut.

REFLECTING Telescopes completely assembled. 60X, $29.75. Guaranteed Observatory clearness. Free information. Skyscope, 475 Fifth Avenue, New York 17.

BINOCULARS, telescopes, microscopes. Terrific values $3.98 up. Request free money-saving catalog. Criterion, Dept. S-53, Hartford, Connecticut.

AMAZING prices, precision binoculars. Folder "Binocular Selecting," catalog free. Dealers write. Prentiss Importers, Mercury Bldg., West Los Angeles 25, California.

BUILD your own Reflector Telescopes. Complete kit; Mirror, Eyepieces, Tripod, all other accessories. Request free illustrated literature. Criterion Manufacturing, Dept. KP-30, Hartford, Connecticut.

BINOCULARS at wholesale. Catalog 10c. Hallmark House, 1862 Main Street, Springfield, Massachusetts.

FREE Catalog Astronomical, Scientific Optics. Nye Optical, 2100 Cherry, Long Beach, California.

MAKE 6" Telescope reflector. Glass, abrasives, instructions—$12.00. F. Cameron, Box 65, Inwood 96, New York.

ASTRONOMICAL Books, Star-Atlases, free list. Herbert Luft, 42-10 62nd Street, Elmhurst 73, New York.

POPULAR SCIENCE OPPORTUNITIES

200 POWER reflecting telescopes complete with finder scope and tripod—$24.95. 400X telescopes easily made. Kit includes focusing tube, erector, five finished lenses, building instructions—$3.75. Free telescope booklet. Suffolk Science, Mattituck 4, New York.

15 SPORTING GOODS, GUNS, FISHING TACKLE, ARCHERY, TRAPPING

180 PROFUSELY illustrated pages, antique pistols, swords, daggers, armor, etc. 50c. Robert Abels, PS860 Lexington Ave., New York 21.

FREE . . . Catalog. Newest Items. Bargains. Gadgets. Beads. Spinners. Lure parts. Sinker Molds. Finnysports, (PC), Toledo 6, Ohio.

FREE Fishing scent secrets. Jackson's, 212 Lake Avenue, Ithaca, New York.

FREE—Giant 1957 Wholesale Sporting Goods Catalog. Lowest wholesale prices. Complete line of cameras, sporting goods, appliances, outdoor items. Write today. Santa Fe Distributing Co., 1321 Main St., Dept. PS. Kansas City, Missouri.

5,000 BARGAINS, firearms, binoculars, war relics, catalog 50c. Smith Museum, Runnemede, N. J.

SAMPLE: 25c copy of "The Archers' Magazine." Send 10c; 1200 Walnut Street, Philadelphia 7, Pennsylvania.

17,000,000 GUN Parts Stocked—modern, obsolete, foreign. Send tracing, description for quotation. 44/40 Instant Gun re-bluer, takes seconds—largest selling—absolutely guaranteed, $2.00 bottle. Junked guns wanted for parts—$1-$5 each plus postage, any kind, condition. Ship off—check airmailed. Numrich Arms, West Hurley 17, New York.

SEND for Free Monthly Bargain List. Zebco 33 $11.50. Mitchell 300, $17.50. Johnson Century $10.75. Weaver (60) K2.5 & K3 $25.95. Lyman 4x $36.50. Marlin 90 DT, $74.95. 20%. Deposit on C. O. D.'s. Parker Distributors, Dept. 2904, P. O. Box 55, Williamsbridge Station, New York 67, New York.

SKIN Divers—dive for profit! New underwater metal detector locates sunken outboard motors, cameras, etc. Waterproof, self-contained unit, illuminated meter. Free information. Goldak, 1540 W. Glenoaks, Glendale, California.

NYLON Rope, Lines, Cords. Every description for all sportsmen and household uses. Finest made. Free catalog. Beebe Cordage Company, Cranford 7, New Jersey.

MOLDS for Fisherman's Sinkers, Jigs, Squids, Casting and Spinning Lures. Free Catalogue. Sweet's Molds, Tonawanda 3, New York.

OWN The Fastest Gun Going, And the most accurate. New Lightning, .22 cal., L.R. Automatic pistol 23 Oz. 10 shot. Aims better, fires faster, shoots straighter than any pistol. Possible only with monobloc construction. Floating action. Only $39.95. Recommended by leading gun experts. Order now and get a free holster. $5.00 down, balance C.O.D. Godfrey Corp., 201 Broadway, New York 7, New York. Write for free 2 color illustrated catalogue.

SCALE Fish Electrically. Salesmen wanted. Send $1.00 for sample new rotoscaler adapter plus fish gripper, free details other big sellers. Joseph Bolduc, 1045 West Grand, Muskegon, Michigan.

FREE! Write for Klein's Wholesale Tackle & Accessory Circular. Why pay retail prices when you can buy wholesale at Klein's on Credit and pay only $2.00 down? Klein's, 227 W. Washington, Chicago 6, Illinois.

JAP rifles altering American shells $6.00. Jap shells $3.65, catalog 5c. TP Shop, West Branch 10, Michigan.

OVER 500 Antique, Modern Guns, Powder Flasks, Swords, Edged Weapons. Large list 25c coin. Ed Howe, 26 Main, Coopers Mills, Maine.

16 CAMPING EQUIPMENT & TENTS

CAMPING, Hunting, Diving! Free equipment catalog: McCanna, (PS-4), Tarrytown, New York.

TENTS, world's largest selection, direct from manufacturer. Send 20c for 136 page Tent, Camping Equipment Catalogue-Handbook listing all national camping sites. Morsan 10-15G 50th Avenue, Long Island City 1, New York.

VACATION Campgrounds—Southeastern Edition. Complete guide—facilities, supply sources, attractions. 75¢ Box 265, Maryville, Tennessee.

17 DOGS, BIRDS, HAMSTERS, RABBITS & PETS

HAMSTERS—Golden: young, $3.00 pair. Fully developed, $4.00 Pair. Adirondack Hamstery, Prospect 13-D, New York.

RAISE rabbits on $500 month plan. Plenty markets. Free details. White's Rabbitry, Mount Pleasant, Michigan.

RAISE Rabbits Successfully By Knowing Facts. 48 page illustrated book describing 25 Breeds, Housing, Feeding, Breeding, Marketing, etc. Plus Bulletin. 25 cents. American Rabbit Association, 80 ARBA Building, Pittsburgh, Pennsylvania.

CHINCHILLAS final liquidation! $50.00 to $100.00 pair. Bright's Chinchillas, 2312 N. 38 St., Kansas City, Kansas.

GERMAN Shepherds—Guaranteed—Time payments. Faerie Dell Kennels, Meshoppen 6, Pennsylvania.

PETS. All Kinds. Catalog $1.00. Carroll Blakey, Morals 2, Alabama.

RAISE rabbits For meat, fur, laboratory and other commercial purposes. Details 25c. Wilson's Rabbit Farm, Greer, South Carolina.

MAKE Big Money Raising Nutria, Chinchillas, Cavies, Mink, Rabbits, or Pigeons for us. Free information. Keeney Brothers, New Freedom, Pennsylvania.

NUTRIA. $300 up!! Collies, Brandons, 1539 Washington St., El Cajon, California.

HAMSTERS—Ideal pets. Young Golden pairs $2.95, breeders $3.95. Free Booklet. Jer-Fre's Hamstery, 2425 Hoyt, Muskegon Heights 14, Michigan.

$$$$GROW Mushrooms. Cellar, shed. Spare, full time, year round. We pay $3.50 lb. We have over 25,000 customers. Free Book. Mushrooms, Dept. 177, 2954 Admiral Way, Seattle, Washington.

ANGORAS, Chinchillas—World's most profitable rabbits! Particulars free. Grinsteads, Edwardsville, Illinois.

18 EARTHWORMS & FROGS

$10,000 YEAR possible, earthworms. 32 Page booklet, tells how 35c. Missouri Earthworm Research, Box C-6851, Kansas City, Missouri.

ANNOUNCING New Hay Bale Tub Gardening plan, raising earthworms the easy, inexpensive way. Information free. Bredin, Turley, Oklahoma.

FROG—Crayfish Raising Profitable Information 10¢. Vol Brashears, Berryville, Arkansas.

19 FARMS, OTHER REAL ESTATE

FLORIDA—Nice homesites, $345 at $10 monthly. Folder Free. Winfree Vernor, DeLand, Florida.

FLORIDA Lakefront Homesites. Easy monthly payments. Complete literature free. Write Box 1311, Eustis, Florida.

NEW Strout Spring Catalog Mailed Free! 34 States. Coast-to-Coast. Bargains galore. Farms, Homes, Businesses. World's Largest; 57 Years Service. Strout Realty, 251-ZB 4th Avenue, New York 10, New York.

CANADIAN Tax Sale Lands for three dollars an acre and up. Small monthly payments. Farms, timber, hunting and fishing camps, minerals. Limited number of properties. Write at once for free catalogue. Tax Sale Service, Room 113, 120 Bloor St., W., Toronto 5, Canada.

FLORIDA—Beautiful Homesites—80 by 135 feet, only $240—payable $10 monthly. High, dry, amid sheltering pines. Near famous Panama City Gulf resort. Outstanding deep sea, surf and freshwater fishing. Finest hunting, boating, bathing. Illustrated Booklet Free. Douglas Wood, Fountain, Florida.

MINNESOTA waterfront tracts $10 down. Norstates, Box 645-P, Houston 1, Texas.

FLORIDA—50'x125' homesites; $10 down, $10 monthly; Full price—$395. Outskirts Bushnell; Highway 301; City conveniences, no city taxes. High elevation. Free information. Austin and Dawson Realty, Brooksville, Florida. Dept. PSM.

20 TREES, SHRUBS, ROOTS, HERBS

TREES And Shrubs—Raise your own from seed for shade, windbreak, snow fence, ornament, erosion control, etc. For free planting guide—price list, write Woodlot Seed Company, Norway 46, Mich.

GINSENG, Goldenseal Roots bring up to $14 pound. Full information. F. G. Collins, Viola, Iowa.

21 POULTRY & SUPPLIES

RAISE pheasants on $100 week plan. Little capital and space can make you independent. Free details. Great Central System, Columbus 6, Kansas.

22 PROFITABLE OCCUPATIONS

$5000 FROM Half Acre growing Ginseng, crop bought. Particulars 10c. Associated Growers, Sperling, Manitoba.

YOUR Own Wholesale Business Without Investment. Free Catalog. Norris, 487-H Broadway, New York.

WELDING Pays $$$. Learn easily at best equipped school in country. Nonprofit school with low cost training. G.I. approved. Write Hobart Trade School, Box P-472, Troy, Ohio.

$60 WEEKLY, spare time—easy! Home Venetian Blind Laundry. Free book. Burtt, 2434B Wichita 13, Kansas.

MAKE Money Writing Short Paragraphs! No tedious study. I tell you what to write, where and how to sell; and supply list of editors buying from beginners. Many small checks add up quickly. Write to sell, right away. Send for free facts. Benson Barrett, Dept. C-86-D, 7464 Clark, Chicago, 26.

FREE! "301 Profitable Small Businesses!" Amazing shoestring plans! Work home! Start sparetime! Deumant Surveys, Kenmore 23-T, New York.

HIGH Paying Jobs; Foreign, USA. All trades. Travel paid. Information, Application forms. Write Dept. 21K, National, 1020 Broad, Newark, New Jersey.

LEARN Locksmithing from licensed experts at home in your spare time. High pay. Earn as you learn. Locksmithing Institute, Rutherford 33, New Jersey.

60% PROFIT Cosmetics $25 day up. Hire others. Samples, details. Studio Girl-Hollywood, Glendale, Calif. Dept. 1174H.

BUY Wholesale! Discounts to 80%! Appliances, Cameras, Sporting Goods, Housewares, Watches, Tools, Clothing, etc. Buy-Rite, Hawthorne 7, New Jersey.

OIL Burners, Complete Book, Installation, Servicing. Become highly paid mechanic in new expanding industry. Send $5.00. Handy-Size Books, Box 451, Radio Sta. P. O., New York 19, New York.

$200.00 A week cleaning Venetian Blinds. Build equipment from odds and ends. Full instructions and business secrets $2.00. J. E. Moore, 501 E. Aspen, Fruita, Colo.

BIG 20 lesson course on mail order. Details Free. "Business," 60 Ormes, Quebec 3, P. Q., Canada.

FREE Folder, "How to Make $3,000 Yearly Sparetime, Backyard, Raising Earthworms!" Oakhaven-7, Cedar Hill, Texas.

BIG Money raising fishworms and crickets. Free Information. Carter Farm-10, Plains, Georgia.

$1,000 PER month. Cost $15.00. Steady. Exclusive. Plan sent, 15 day trial. Write: Horsley, 1831 24th Ave., NW, Calgary, Canada.

BAKE New Greaseless Doughnuts in kitchen. Sell stores. Free details. Samuel Ray, 3605 South 15th, Minneapolis 7, Minnesota.

FORTUNES Made raising Crickets, Worms. Free Literature. Three Oaks Ranch, Dresden, Tennessee.

$$$$GROW Mushrooms. Cellar, shed. Spare, full time, year round. We pay $3.50 lb. We have over 25,000 customers. Free Book. Mushrooms, Dept. 101, 2954 Admiral Way, Seattle, Washington.

POPULAR SCIENCE OPPORTUNITIES

THEY hand him $100! Free Plan "Secret Journal Hidden Dollars." Work home! Publico-R5, Oceanside, California.

FREE "$5,000-$45,000; Unlimited Vacations." Work home! No merchandise, equipment! Haylings-PS, Carlsbad, Calif.

DISSATISFIED? Discover Profitable, uncrowded professions requiring no license. Free details. Aureag, Central Valley, New York.

FREE Book "505 Odd, Successful Businesses." Work home! Pacific—37C, Oceanside, Calif.

MUSHROOMS In 14 Days Easy. Amazing "Magic" preplanted trays, 3 for $4.50 f.o.b. Free Literature. Mushrooms, 641 South 19th, Newark 3, New Jersey.

23 BOOKS & MAGAZINES

BOOKHUNTERS! Scarce, Rare, Miscellaneous Books. Atlantic Book Service, 10 Cedar, Charlestown 29, Massachusetts.

BOOKS, essays, lectures, plans. Experimental information. Free list. Tipp Scientific Co., Tipp City 6, Ohio.

BOOKALOGUE. Huge discounts. 1,000 bargains. Muriel's, 199 Circuit, Waterbury 8, Connecticut.

BRITISH Book Bargains. Any subject. Catalog free. Transbooks, Box 22-PSP, Brooklyn 36, New York.

SAMPLE, 30c copy of "The Aquarium." Send 10c to: 12th and Cherry Sts., Philadelphia 7, Pennsylvania.

ATHEIST Books. Catalogue free. Truth Seeker Co., 38 Park Row, New York 8.

BOOKHUNTERS: All Subjects. Send Wants! Jaher Book Service, 183 Hazelwood Drive, Westbury, New York.

DISPOSAL Sale: New-Used Books 12—$1.00, 25—$2.00. Persil, 436 N.Y. Ave., Brooklyn 25, New York.

LET your dog feed You. $3,000,000,000 yearly are spent by dog owners. Get your share of it! Dr. Leon F. Whitney shows you 25 practical, proven ways to make money out of the most profitable retirement hobby in the world. Read "Dollars In Dogs". Only $3.95 prepaid. Practical Science Publishing Co., Box 746-S, Orange, Connecticut.

NATIONAL Geographic Magazines 1888-1952. Any issue. Periodical Service, Box 465-PS, Wilmington, Delaware.

JOHN Friend, Bookfinder, can get the books you want. Free Search Service. Box 197PS, Cardiff, California.

NEW book, "Secrets of Chinese Physicians," Illustrations, Cloth, $2.00. Ching Wah, Box 15772, Del Valle Station, Los Angeles, California.

FREE, 100 Books, Guide—10¢. Bartz, 912-A Autumn, Albert Lea, Minnesota.

60 PAGE Booklets! "Scientific Oddities," "Electricity," "Radio," "Physics," "Astronomy," "Tables," "Chemistry," "Light," "Geometry," "Relativity." 10c Each. Franks, 3121 South Racine, Chicago 8.

24 HYPNOTISM

FREE Illustrated Hypnotism, Selfhypnosis Catalogue. Write: Hypnotist, 8721 Sunset, Hollywood 46P, California.

HYPNOTISM! Party Demonstrations. Neige Diehl, Post Office Box 2002, Seattle, Washington.

HYPNOTIZE—Easy Method! Complete course, illustrated. Includes method of hypnotizing several persons at a time. $1.00. Stanley Martin, 6019—19th Avenue, Brooklyn 4, New York.

HYPNOTISM! Complete Service! Books! Tapes! Accessories! Drawer PS4-697, Ruidoso, New Mexico.

BEGINNER'S Hypnosis . . . Illustrated $1.00 Moneyback Guarantee. Baltimore School of Hypnotism, Dept. 74C, Box 6229, Baltimore 6, Maryland.

SERIOUSLY interested in Hypnotism? Write today: PMR Institute, Biddeford, Maine

HYPNOTIZE yourself and others—with new 33⅓ RPM Record. Develop latent talents, overcome weaknesses. $5.95 postpaid or COD plus postage. Particulars on request. K&W Enterprises, Box 535-B, Miami 35, Florida.

HYPNOTIZE Successfully! Learn Easy, Fast, Modern Methods. Complete, Illustrated Course, including self-hypnosis and "Secret Nerve Pressure Technique" (Guaranteed Harmless)—$1.00. H. Fowler, 5184 Sheridan Village, Schenectady, New York.

LEARN Hypnotism—our book 25 lessons in Hypnotism shows how to achieve business and social success. $1 postpaid. Satisfaction guaranteed. Books Publishing Co., Amityville 29, New York.

25 LESSONS In Hypnosis. Send One Dollar To, K&W Enterprises, Box 535B, Miami 35, Florida.

25 MAGIC TRICKS, PUZZLES, ETC.

500 TRICKS. Douglas famous 120-page Catalog, only 10c. Fastest service to magicians for 30 years. Send 10c today. Douglas Magicland, Dept. 2, Dallas, Texas.

3100 NOVELTIES, Jokes, Tricks, Gadgets, Funmakers, Hobbies. Big catalog 10c. Johnson-Smith, D-408, Detroit 7.

WORLD'S finest professional magic. Joker novelties. Giant illustrated catalog 10c. Top Hat, Evanston 13, Illinois.

"HOW Gamblers Win" exposed. Valuable literature 10c. Book, Box 671, St. Louis 1, Missouri.

SENSATIONAL Vanishing Handkerchief Trick. Complete with instructions. 60c. Magicraft, Box 8094, Akron 20, Ohio.

ALCHEMIST Metal, Melts in hot coffee. Sample $1.00. Alchemist, Box 11182, Dept. A, Fort Worth, Texas.

1957 COMPLETELY Illustrated 500 Trick Catalog 25¢. Stowell's, Woodstock, New York.

FREE—Illustrated catalog Magic-Houdini Tricks, Entertain—Make Money. Great Opportunities. Write Today. Heaney Mysteries, Oshkosh, Wisconsin.

BE a magician! Large professional catalog of latest tricks. 35c. Ireland, F-109 North Dearborn, Chicago 2, Illinois.

"VENTRILLO" Professional Voice Thrower and Catalog 25c! Box 971-PS, Philadelphia 5.

SENSATIONAL Magician's Wand (Vanishes Handkerchief!) 25c, catalog included. Box 1352-PS, Philadelphia 5.

WHOLESALE! Thirty 10c Trick Novelties $1.00! (Profits!) 1746-SW Market, Philadelphia 3.

DOLLAR Magic Set Free with Catalog 25c. 4462-PS Germantown, Philadelphia.

SMOKEBOMBS 25c, 7 for $1.00. (Terrific!) 4463-PS Greene, Philadelphia 44.

26 COINS & CURRENCY

FREE! Foreign coin banknote and Coin Collectors' Illustrated Catalog to approval service applicants. Send 3c postage. Tatham Coin Co., Springfield-50, Mass.

GET Profit and Pleasure in collecting old coins. Send 10c for 56-page illustrated coin catalog. You'll be delighted with it. Send for it now. B. Max Mehl, 374 Mehl Building, Fort Worth, Texas. Largest rare coin establishment in U. S. Established 57 years.

COINS from Formosa, Vatican, etc., plus foreign banknote, 10c with coin approvals. Littleton Coin Company, Littleton 82, New Hampshire.

MORGAN Dollars: 1878-87-89-90-91 $2.00 ea. Catalogue 25c. Shultz, Salt Lake 10, Utah.

THOUSANDS foreign coins. Lists 6c. Lauren Benson, 2526B Middle Road, Davenport, Iowa.

INDIAN Cent and coin price list 10c. R&M Co., Box 5, Delanco, New Jersey.

FLYING Eaglet Coin Journal, Samples, Send 25c or Stamps. 229X South 11th St., Newark 7, New Jersey.

INDIANHEAD cent, foreign bill, list, 20c. Haas, 2205 Northland, Lakewood 7, Ohio.

BARGAIN lists, Indianhead cent, 10c. Economy Sales, 156-B Dean, Mansfield, Mass.

COMMEMORATIVE Half Dollar Uncirculated $1.00. Bargain Lists Free. Sayers, 1000 East Unaka, Johnson City, Tennessee.

36 DIFFERENT Foreign Coins $1.00. Robbins, 1009 Cleveland, Montgomery 8, Alabama.

$4,000.00 FOR 1913 Liberty Head Nickel. Uncirculated Dollars 1804 to 1839, 1893-S, 1895-P, 1903-O pay $100.00—$5,000.00. Certain dates—Small Cents before 1915,—$325.00; Dimes before 1917—$2,000.00; Quarters before 1924,—$1,000.00; Half Dollars Before 1905,—$1,000.00; 2c pieces,—$70.00; 3c pieces,—$90.00; Halfdimes,—$500.00. Hundreds of others worth $10.00-$1,000.00. Canadian Coins,—1921-5c Silver, $50.00. 1889-Dimes,—$25.00. 1875 Quarters,—$50.00. 1921-50c—$200.00. Wanted—20c Pieces, Gold Coins, Paper Money, etc. Our Large Illustrated Guarantee Buying-Selling Catalogue, Giving Complete allcoin information—send $1.00. Purchase Catalogue before sending coins. Worthycoin Corporation, Leaders Numismatic Quotations K-237-C, Boston 8, Massachusetts.

UNCIRCULATED Lincoln Cents 10 Different $1.00. All Years and Mints 1936 thru 1956 $12.00. Guidebook $1.75 Postpaid. Louis Bell, Box 1575, Decatur, Alabama.

COIN Magazine, 160 pages. Sample 35c. Numismatic, 7320 Milwaukee, Chicago 31.

U.S. Large cent and coin bargain lists, only $1.00. Delmaco, Box 1123B, Wilmington, Delaware.

CONFEDERATE Money. We have located a limited supply of counterfeit Confederate Money, six denominations, 5, 10, 20, 50, 100's. 25c a bill, full set $1. LaRue's Coins, 1138 Mississippi, Lawrence, Kansas.

LINCOLN Cents 1910-S, 1913-S, 1921-S, 1924-S, 1923-S, 1933-D all for $2.00. Gasser's, Box 34615, Los Angeles 34, California.

SET Lincoln Cents 1941 through 1956 All mints and dates. Brilliant Uncirculated in Coin Folder $4.00. Price List Free. Joray's, Box 38, Shouns, Tennessee.

SAN Francisco Mint Closed! Made only cents and dimes in 1955. In short supply and great demand. One each, brilliant uncirculated, for 25c. Free coin lists with order. Bryson Coin Company, 612 White, Toledo 5, Ohio.

BEAUTIFUL New Complete Sets—Cameroons, Cambodia, Laos, Libya, Peru, Siam, Tahiti, VietNam 95c each. Jefferson Nickels $21.50; Roosevelt Dimes $14.95; Franklin $½ $28.50. Our Giant 80-page Bargain Catalogue—Only one like it in America—$1.00. Bebee's, 4514 North 30th, Omaha 11, Nebraska.

27 OLD STAMPS WANTED

$100.00 FOR certain old stamps. Price-list picturing stamps wanted, 25c. Lincoln Stamps, D-704, Glendale, Arizona.

28 STAMP COLLECTING

TWO $5.00 US stamps plus 20 different, 10c with US approvals. Irwin Stamp Co., Box 1109, Brooklyn 30, New York.

50 DIFFERENT U.S. 5c with bargain approvals, lists. Bookman, Box 8245-S, Madeira Beach, Fla.

AMAZING Offer! 200 U.S. stamps—including commemoratives, airmails, high denominations to $1.00—only 10c to Approval Applicants!! Illustrated Bargain Lists free. Mystic Stamp Co., Dept. 55, Camden, New York.

FREE Stamp Collection!—100 different stamps from Europe, Africa, Asia, Scandinavia, Balkans, etc. 3c to approval applicants. Tatham Stamp Company, Springfield 50, Mass.

U.S. Classics—Over 50 Yrs. Old. 15 Selected oldtimers. Missing in biggest collections. All 15 at less than 1c each. 10c with approvals. Jaro, Box 246-P, New York 8.

ICELAND 10 different beautiful stamps for only 10 cents to applicants for our good old fashioned approvals. Old Colony Stamp Co., Dept. B, Milford, Conn.

WEIRD Diamond Shape Coffee Stamps. Lovely Flower Triangle! First American big commemorative. Greenland, Idol Dancer, etc. Free with approvals. Capital Stamp Co., Ferrysburg 10, Michigan.

NUDES Set; unusual approvals—10c! Atlas, 1326 Vilas, Madison 5, Wisc.

POPULAR SCIENCE OPPORTUNITIES

GIANT Stamp Zoo Free! Snakes, Leopards, Rhinoceros, Zebu, Koalabear and other fierce jungle beasts. Approvals. Send 10c for handling. Free stamp Magazine. Lincoln Stamp Co., St. Catherine's, 519, Ontario.

UNITED States commemorative collection containing 33 different—10c. Approvals. White, 516-W Avenue L, Brooklyn 30, New York.

30,000 DIFFERENT 1½c each! Build biggest collection—as fast as you like. Start Now! Free details. Huppert, 1972 E. 18th Street, Brooklyn 29, New York.

ADEN to Zanzibar! A special collection of over 200 different stamps from Aden, Barbados, Cyprus, Dahomey, Egypt, Falkland Is., Guadeloupe, Hejaz, Israel, etc. to Zanzibar. Very unusual collection, catalog value easily $5.00. Some really scarce ones included! Only 25c to approval applicants! Write today and receive Free—Eisenhower, Grace Kelly and Geo. Washington stamps from Monaco! Lyle Clark, Muskegon 10, Michigan.

"WOW!" 135 All Different Germany 10c." Big collection includes old Zeppelins, Semi-Postals, Airmails, High Values, Giant and Midget-sized Stamps. Extra! Complete bargain catalog, free booklet. Approvals. Jamestown Stamp Company, Dept. A4PSC, Jamestown, New York.

225 STAMPS For only 10c! This mammoth value includes Airmails, Pictorials; stamps from strange Countries catalouging up to 25c each! Also Approvals. Mystic Stamp Company, Camden 55, N. Y.

PICTORIAL Packet from Antigua, Barbados, British Guiana, British Honduras, Burma, Curacao, Leewards, Rhodesia, Trinidad, Tobago, and many other hard to get countries. Bi-colors, topicals. Tremendous value. Each stamp a beauty. 10c with inexpensive, attractive approvals. Roseland Stamps, Spring Lake 10, Michigan.

FIRST U.N. Set Among World's Prettiest. Only 10c. Approvals. Welles, Box 1246-V, New York City 8.

FREE! Armenia; 9 Bi-Coloreds, (50c Value), with Approvals. Diane, Box 65-S, Myrtle Beach, South Carolina.

TWENTY different Mexico 5c. Approvals. Stampcraft, Box 935B, Brownsville, Texas.

FREE! 107 British Colony Stamps. All different, from Britain's farflung colonial empire. Catalog value $2.50. Free Stamp Magazine, Approvals. Send 10c for handling. Act now! Niagara Stamp Co., St. Catherine's 72, Ontario.

FREE! Amazing List! Two Feet Long! All Countries! Stampmart Company, Hartford 1, Connecticut.

NOW! 200 Different Stamps including P.D.R. Triangle also Scarce War Ration Stamps. Only 10c to approval applicants. Avalon Stamp Co., Dept. S, Springfield, Mass.

FREE! Large New profusely illustrated catalog of United States postage issues complete; 64-page Stamp Collectors' Guide; other unusual offers. Write today! Harrisco, 1785 Trans't Building, Boston 17, Massachusetts.

100 LATIN America 25c. Plus surprise packet. Packet list free. Econopackets, Box 168, Riverside 22, California.

SUPERIOR worldwide mission mixture. Amazing variety! Half pound $1.98 postpaid. Bay Nielsen, 4545A Harvard, Montreal 28, Canada.

FREE U.S. Price List. Mark Hanna, 335 Fifth Avenue, Pittsburgh 22, Pennsylvania.

25 BEAUTIFUL Ceylon pictorials 25c! Giant illustrated catalog Free. James, Box 1111S, North Redondo Beach, California.

PENNY Approvals By Country. M. H. Hoerning, Merriam, Kansas.

ECONOMICAL ½-3c Approvals. 33,000 varieties. Dresel, Box 128-T, West Englewood, New Jersey.

14,000 DIFFERENT! Fascinating new Club Plan systematically builds your collection. Only 50c weekly. Details free. L. G. Ware, Baldwin 70, New York.

FREE Packet! Angola, Azores, Mongolia, Nepal, Palestine. Fascinating Approvals. Coral, Box 7095, Ludlam, Miami 55, Florida.

GIANT Approvals Thousands Different 1c and 2c Each. Wahl's Stamp Exchange, 7008K Farragut, Chicago 31, Illinois.

100 OLD U.S. Stamps between 1861 and 1935 $1.00. Rousch Stamps, 51 Chestnut, Mansfield, Ohio.

JAPAN Souvenir Sheet 10c with approvals. Ralph Rice, 15 Longlane Road, West Hartford 7, Connecticut.

OLD scarce U. S. seconds on approval. Slightly defective bargain prices. Hearnfield, Clintonhill Station, Newark 8, N. J.

LIBERIA Beautiful set of four native flowers, priced at 60c in Standard Catalog, only 10c. Approvals. Goliath Company, Bethlehem F2, New Hampshire.

U.S. Stamps. Discount Priced. Giant Catalog—15c. Raymax, 35-VX Maidenlane, New York City 38.

DEALERS Wholesale catalog. Postage 3c. Frankson, 5031 Queensbury, Baltimore 15, Maryland.

300 DIFFERENT given free with approvals. Postage 3c. Particulars. Windsor Stamps, 8834 Cornell Ave., Chicago 17.

DIAMOND Roosevelt, Pope, Triangle, Greenland, Angola, 51 others, 5c. Approvals. Longhorn, Box 3068P, Lubbock, Texas.

CANADA—Newfoundland collection including early issues, commemoratives, pictorials and high values. Plus set of fascinating triangle stamps. Plus set of unused British Colonies. Plus large stamp book. All four offers free. Send 10c to cover postage. Empire Stamp Corp., Dept. PR, Toronto, Canada.

FREE sample stamp newspaper, information on collecting, special lists. Approvals. Littleton Stamp Co., Littleton A2, N.H.

FREE—Stalin Giant "Iron Curtain" Set. Approvals. Seminoles, Dayton, Tennessee.

50 DIFFERENT Turkey 10c With Approvals. Martinsen, Box 115, New York 33, New York.

SPECIAL Set Offer. 14 Complete sets from 14 different countries, includes Andorra flowers, Natal Commemoratives, plus 12 other attractive sets. All 31 stamps only 10c to approval applicants. Moumblow, 3048 Lynn, East Northport, New York.

100 DIFFERENT Japan 15c. Approvals. Raymond Verhaalen, 202-01 43rd Avenue, Bayside 61, New York.

FIRST Stamps issued, from ten different countries, only 10c, with approvals. Variety Stamps, 57-K Circuit, Newton Highlands 61, Massachusetts.

101 DIFFERENT Central and South American Stamps 25c to introduce Latin approvals. Caribe Stamps, Box 295, Boynton Beach, Florida.

FIPEX Sheet 10c U. S. List Free. Scarlet, 191-17 104th Ave., St. Albans 12, New York.

25 COLORFUL Cuba only 5c with approvals. Montalto, New Church, Virginia.

FREE 50 foreign stamps with approvals. Storm, 206 Eaton, Bartonville 3, Illinois.

FREE! Sport, Flower Triangles! East Indies, Others. Free Gift. Approvals. Delton Page, Box 201, East Paterson, New Jersey.

NETHERLANDS Collection, 50 Different. Free! Bargain Approvals. Caribbean, Box 266, Shenandoah, Miami 45, Florida.

$8.00 CATALOG Value Worldwide Stamps $1.00. Veteran Frank Stroskey, 223 Market St., Perth Amboy, New Jersey.

FREE—Four Wonderful Triangles. Approvals. Woodward, 716 Valencia, San Francisco 10, California.

50 SOUTH Americans Free! Attractive, Interesting Approvals. Superior Stamps, Box 53, Cathedral Station, New York 25, New York.

ABSOLUTELY Free—Beautiful Flower Triangle Set, plus Giant Roosevelt Diamond. Approvals. Alfred Darrow, Camden, Maine.

105 DIFFERENT stamps 5c. Approvals. Gericke's, Box 756, Milwaukee 1, Wisconsin.

25 DIFFERENT U. S. Commeratives only 10c with approvals. Wm. Rice, 87 Washington Ave., Kingston 76, New York.

CANADA, mint French and British Colonies, complete German sets, Hungarian pictorials, San Marino Dogs, all free with approvals. Stamp Imports, Peterboro, Ontario, Canada.

PHILATELIC Grab bags $1.00. No approvals. Harold Mauk, Pasadena 1, Md.

FREE! Giant catalog offering thousands of bargains. Sent with beautiful approvals. Jamestown Stamp Company, Dept. E4PSC, Jamestown, New York.

BETTER Sets—Singles on Approval. Brand, 425 E. 63rd St., New York 21, New York.

BEAUTIFUL Triangles, ten—10c; eighteen—25c; 25—50c with approvals. Nevin Otis, Lewiston, California.

DEALERS Wholesale List Free. Bargains Airmail. Smith Company, Halfwaytree, Jamaica, BWI.

TRADE duplicates Worldwide group. Starting kit for stamp. Exchange, 813 56th, Richmond 24, Virginia.

CANADA. 100 different 35c with Canadian, British approvals. K. S. Holmes, London, Canada.

102 DIFFERENT Including Triangles, Pictorials, Animals. 10c with Approvals. Finney, Box 89, El Monte, California.

SIX Triangles Free to Approval Applicants. Rare. Box 633, Coconut Grove Station, Miami 33, Florida.

30 DIFFERENT Commemoratives 1893 up 10c. U.S. Approvals. K & B, Box 70, Brooklyn 23, New York.

EXCITING "Strange countries" packet. Free with approvals! Saxon, Orange, California.

FREE 50 Worldwide with attractive inexpensive approvals. University Stamps, P.O. Box 95, Tamiami Station, Miami 44, Florida.

100 DIFFERENT Netherlands, 10c: Inexpensive Approvals. Mattenson, Box 985, Philadelphia 5, Penna.

WANTED!! U.S. stamps. Top prices paid. New-Way Stamp, Lawrence, Mass.

FREE! New Sensational Picture Frame Stamp Mounts. Plus 51 Different Stamps. Plus Stock Album. 10c Handling. Approvals. Surf Stamps, Box 443-S, Wildwood, New Jersey.

1000 FINE Mixed U.S. Stamps 25c. Wright, Box 1122, Hagerstown, Maryland.

WEDDING, Fipex, Triangles, Animals, Free! Inexpensive Approvals. Rose Stamps, Box 415, Emporia, Kansas.

STAMP collecting outfit, includes packet worldwide stamps, package hinges, watermark detector, millimeter gauge. Everything, 10c with approvals. Lorain Brown, Marion 2, Michigan.

FREE! Flowers, Animals, Birds, Sports; interesting, inexpensive approvals follow. Valee, Box 2103, Arlington 4, Virginia.

MACAO, Nepal, Burma, Transvaal, Haiti, Free! Satisfying Approvals Follow. Deival, Box 142, Palmyra, New Jersey.

WANT Lists Filled. 100,000 varieties available. References. Downey Stamp Service, Box 70B, Bell, California.

PENNY Approvals; Bargains for Pennies. Free Gifts. Penny Stamps, Orange 2, California.

IRAQ, Iran, Syria, Lebanon, Egypt, Israel. Free! Popular Approvals. Panorama, Box 229, Miami 2, Florida.

FREE Packet! Fruits, Flowers, Birds, Fish, Animals. Popular, Inexpensive Approvals. Spear, Box 1626, Little Rock, Arkansas.

1500 STAMPS, $1.00. Good variety. On and off paper. World wide. Many pictorials. No approvals follow. Satisfaction guaranteed. Whalen, 1435 First Ave., Oakland 6, California.

FREE! 20 Egyptians; Attractive approvals. Somith, Box 83, Brooklyn 3, (Rugby) New York.

FIVE Different Sets French Colonies, 10c with Approvals. Banner, Box 65, Park Forest, Illinois.

WONDERFUL Offer Seven complete mint sets only 10c with approvals. Reich (S26), 1033 Lawrence, Chicago 40.

POPULAR SCIENCE OPPORTUNITIES

MINT U.S. Plate Blocks. Bargain Approvals. Kuehl, 3125 East K, Tacoma 4, Washington.

10 DIFFERENT Animals Free: Bargain Approvals. Wilber, R.D. 7, Box 332, Glenridge Road, Schenectady 2, New York.

SOUVENIR Sheet Russia 1937 10c with Approvals. Kingman Specialties, 30 Empire, Yonkers 4, New York.

COVERS: First-Days, First Flights, Navy, 10c: Foreign Stamps 1c Approvals. Wm. Barr, 467 Oneida, Pittsburgh 11, Pennsylvania.

70 DIFFERENT U.S., including 35 Commemoratives 25c. No approvals. Seidenberg, Appleton, Wisconsin.

FREE! Collection 50 Beautiful Italy: Colorful Popular Approvals. Cs'kill Stamps, 10 Milton, Liberty, New York.

SIX Different Colorful Roosevelts, Free!! Attractive Inexpensive Approvals. Americana, Box 1560, North Miami, Florida.

FREE! Packet Libia, Syria, Iran, Iraq, Armenia, Palestine. Bargain Approvals. Choice, Box 366, Miami Beach 39, Florida.

50 DIFFERENT Beautiful Switzerland Free! Interesting, Inexpensive Approvals. Cliffe, Box 97 Hudson Heights, New Jersey.

RHODESIAS. Fourteen Different Including Queens 10c. Approvals Accompany. Douglas, Hawkesbury, Ontario.

UNITED States Catalog Free! Bailey Stamps, 45 Bromfield, Boston 8, Massachusetts.

FREE! 55 British Colonies. 5c Handling. Kensington Stamps, Buffalo 15, New York.

FREE! Bahamas, Cayman, Fiji, St. Lucia, Honduras, Trinidad. Exciting approvals accompany. Rogers, Box 485-T, Albany 1, New York.

FREE Mint Collection! Ascension, Pitcairn, Mauritius, Norfolk, Montserrat, Virgin; Fascinating Approvals. Lincoln, Box 157, Wood River, Illinois.

QUALITY Approvals At 2c Each. Hadrian, 12 East 31st, New York City 16.

10 DIFFERENT Israel 10c, Bargain Approvals. Klein Stamps, Long Island City 6, New York.

MONGOLIA, Curacao, Armenia, Libia, Manchukuo, Suriname, All Free! Exciting Approvals. May Stamp Service, Box 986, Coral Gables 34, Florida.

100 DIFFERENT 10c With Approvals. Jacobsen, 4395-C Broadway, New York 40, New York.

FIFTY mailing envelopes. Designed with printing especially for stamp collectors. Only $1.00. Tasker, 1603 Peach Street, Alexandria, Virginia.

ZARAGOZA Religious Set Free With Request for Approvals. William, Diamond, Pennsylvania.

FREE! Monaco "Triangle," Cameroons! Togoland! "Zaragoza" Commemoratives! Approvals. Keating, 2520-M Boulevard, Jersey City, New Jersey.

FREE Sample—Interesting, informative, illustrated! National Stamp News, Anderson, South Carolina.

ICELAND, Suriname, Curacao, Trinidad, Transvaal, Free! Interesting, inexpensive approvals follow. Cedar, Box 475, Barron, Wisconsin.

FREE! Seven Short Sets! Approvals. Gernert, 4235-Y Alton, Louisville 7, Kentucky.

UNITED Nations Mint 10c Approvals. Dolinco, 31 Park Row, New York City 38, New York.

UNITED States. Fine Mint Airmails. #C7, #C8, #C9, #C10. Only $1.00. Approvals accompany. Whiton Paine, Westport 12, Connecticut.

1,000 MIXED U.S. Stamps—$2.00 Postpaid. Glenn H. McElhannon, Greenwich, Connecticut.

PENNY Approvals jammed with Bargains. For better values, try Putnam Stamp Company, Mahopac, New York.

FREE stamps, albums, packets, for approval customers. Bengston, Box 713d, Minneapolis 1, Minnesota.

UNITED States Packet Free! Approvals. Jaydee, Box 721, Brooklyn 1, New York.

MONACO triangle set free. Approvals. Weitz, Box 83G, Orange, New Jersey.

TRIANGLES French Colonials, plus 50 different 10c with approvals. Bennett, Candor 2, New York.

FREE. 10 Different Mint Airmails, 10 Countries. Inexpensive Approvals. Pan-American, Box 24, Coconut Grove, Miami 33, Florida.

FREE your choice any volume Scott's International, Master Global albums, Scott's 1957 Catalogues, when you buy our sensational foreign approvals. Write for details with trial selection. Bargain Stamps, Redlands, California.

50 PORTUGUESE Colonies Or 50 French Colonies, 25c. Approvals. Roy Farr, 455 King William, Hamilton, Canada.

50 DIFFERENT Cuba, 300 Different Belgium. Both $1.00. Approvals. Sevel, 12517 Brackland, Cleveland, Ohio.

60 PAGE U.S., U.N. illustrated catalogue free. Stone, 192-S Washington, Boston 8, Massachusetts.

50 DIFFERENT stamps free with approvals. Senator Stamp Co., Box 1522, Arlington 3, Virginia.

U.S. Revenues on approval. Eljay Stamps, Box 286S, New York 36, New York.

FREE! Eight sided stamp, Triangle, Diamond, Midget, Mammouth, to approval buyers. Plymouth, Dept. 81, Bell, California.

SELECT U.S. on approval. Mint, used. Glasbury Stamps, Fairfax, Vermont.

BELGIUM Collection 50 Different, Free! Quality. Attractive Approvals. Wright, Box 332, Green Cove Springs, Florida.

25 NORWAY, 5c To Approval Applicants. Dixie, Box 1992, Meridian, Mississippi.

THOUSANDS Of Exciting Stamps—only 1c, 2c each! Free examination. Cole, Box 223-G, Buffalo 21, New York.

8 CANAL Zone 10c. Approvals. Merkel Stamps, 45 Cherry, Holyoke, Mass.

25 INDIA, Free With Approvals. Willow, Box 171, Wickliffe, Ohio.

"MONACO Nudes" 10c with approvals. Royal Stamp Company, Tamaqua 2, Pennsylvania.

UNITED Nations Postcard—10c. Approvals. Gatewood, Box 346, Winston-Salem, North Carolina.

GET 500 Stamps World Wide 50c. 100 United States Free, Order From Distributor John Hatt, 127 Hammond St., Bangor, Maine.

FANTASTIC Collection: Triangles, Bicolors, weird fish, jungle beasts, British Colonies, dead countries, sports, Siberian Surcharges, wild birds, flying horse, many more, just 5c; approvals and bargain catalog. James Menefee, 4307 Butlerplace, Oklahoma City 18, Oklahoma.

U.S. mint specials! 13 different commemoratives, 25c; flags, complete, $1.00, 4 different souvenir sheets, $1.00. Free price list. Brooks, 2352P East 23rd Street, Brooklyn 29, New York.

FREE: Ten Different Ancient-Modern Locomotives! Attractive Approvals. H&H Stamp Center, Box 76, Brooklyn 26, New York.

29 ANTIQUES, RELICS & INDIAN GOODS

MOUNDBUILDER Arrowheads: Twenty-five $5.00. Book-Relic Catalog 50c. Tilton Relics, Topeka 10, Kansas.

SELLING 100,000 ancient Arrowheads, Spearheads, Tomahawks, etc. List free. Lear's, Glenwood, Arkansas.

4 PERFECT Arrowheads $1.00. Smith, 841 N. Tacoma, Indianapolis 1, Indiana.

3 WAR Arrowheads, Scalping Knife $2.00. Catalog Free. Arrowhead, Glenwood, Arkansas.

30 MINERALS & PRECIOUS STONES

ULTRA violet lamps economically priced. Free literature. Radiant, Box 5PS, Cambria Heights 11, New York.

SAPPHIRE, Topaz, tourmaline, garnet, peridot. Five uncut gem specimens, $1.00. Ten polished gems. Baroque shaped, $1.00. Free bargain list, jewelry, gems, profitable, easy "do-it-yourself" projects. O'Brien's, 1116B Wilcox, Hollywood 38, California.

EARTH Science, the Rockhounds' national magazine. Subscription $2.00, sample 25c. Box 1357, Chicago 90.

GEMCUTTING — Silvercraft magazine. Learn to cut gems, make jewelry. Ads give sources equipment, gems for cutters, collectors. Free literature. Sample copy 25c. Lapidary Journal, Box Mar 3, California.

GOLD, Silver and Copper Ore with Catalog 50c. Gemco, Eisner Avenue, Sheboygan, Wisconsin.

LARGEST gem and mineral magazine tells how to have profitable fun with rocks, gems, jewelry. Monthly, $4.00 year. Sample 20c. Gems & Minerals, Dept. S-4, Mentone, California.

31 HOBBIES, COLLECTIONS

INVENTING can be an interesting and profitable hobby. Write for complete particulars. Institute of American Inventors, Dept. 30-E, 635-F St., N.W., Washington 4, D. C.

TROPICAL Butterflies for collectors or art work—10 asst. $1.00. Empire Imports, 2514 Genesee Street, Utica 4, New York, Dept. S.

35 ARMY, Marine Patches, Different, New, only 50c. 100 assorted emblems plus two surprises $1.00. Nazi Badge and foreign catalog 50c. Insignia Club, Box 71-S, Station "A", Brooklyn, New York.

NAZI Insignia, 12 different, $1.00. Medals, patches, armbands, flags, daggers. Illustrated lists 15 cents. Medcrafts, Box 532, Victoria, 1, B.C., Canada.

MILITARY miniatures, U.S. Marines, American Revolution, Civil War, Custer's Cavalry, Illustrated Catalog 35c. Bussier Miniatures, Dept. E, 40 Howe Street, Quincy 69, Mass.

COLLECTORS Matchbook covers. 100 Different unused $1.00. Catalog 25c. Album $3.00. Charles Edelman, 1311-F East 84, Cleveland 3, Ohio.

DRAWING is fun! Many suggestions to help you. Only $1.00 ppd. Aiders, 165½ Bunton, Borger, Texas.

REVELL Catalog 25 cents. Model Airplanes, Guns, Boats, Cars. House of Hobbies, Center Street, Manchester, Connecticut.

PLANE Pictures. Second World War. All nations 24 beautiful colored action photos $1.00. Fine collectors item. Suitable album, framing. Dulco, Box 8803-A, Pittsburgh 21, Pennsylvania.

32 PHOTO FINISHING, PHOTOCOPIES, ETC.

PARTICULAR? 8 Jumbos, 35c; 12—50c. Special: 35mm. 36 exp. $1.25. Flash Foto, Box 36H, Brooklyn 4, N. Y.

8—12 EXPOSURE rolls 39c, jumbo prints. Free 5x7 enlargement with each roll developed. Guaranteed work, one day service. Lincoln Studios, Dept. L, Box 13, Lincoln, Nebraska.

FREE 5x7 introductory enlargement with roll. Finest quality Jumbo dated prints in handy super paks. 8 exposures 35c; 12, 55c. Complete color processing. Write Globe Photo, Dept. PS, Box 3508, St. Paul, Minnesota.

ENLARGEMENTS heavyweight eight 5x7's or five 8x10's, $1.00. Jack Koons, Huntington Mills, Luzerne County, Penna.

4X6 OR 3¼x4½ oversize glossy prints. 8 exposures 50c; 12 exposures 70c; 16 exposures 90c. Hagner, 1318 West Columbia Avenue, Philadelphia 22, Penna.

8-HOUR service on deluxe jumbo prints. 8-Exposure roll developed and 8 jumbo prints 40c, 12 exposure 55c, 16 exposure 70c; 35 mm. 20 exposure 75c, 36 exposure $1.25. Jumbo Deckledge Reprints 4c each. Contact prints made if specified. Bay Photo Service, P. O. Box 210, Oakland, California.

QUALITY Kodak finishing, 8 exposure roll 40c; 12 exposure 60c; 16 exposure 70c. Reprints 5c. Fast service. Guaranteed quality, 40 years continuous operation. Be satisfied customer. We do color. Send for mailers. Mail Order Photo Service, Box 297, Watertown, Wisconsin.

BIG Heavyweight Enlargements. 8x10, 30c; 11x14, 70c; 16x20, $1.60. Larger sizes. Satisfaction guaranteed. Gemby, 203 Woodward, Buffalo 14, New York.

POPULAR SCIENCE OPPORTUNITIES

32A COLOR PHOTO FINISHING

EXTACHROME — Anscochrome processed, mounted $1. Fast Kodachrome—Kodacolor Service. Wholesale cameras—equipment—supplies. Send for prices. National Color Corporation, Box 55F, Northside Station, Atlanta 5, Georgia.

33 MOTION PICTURES, SLIDES, SOUND EQUIPMENT

MOVIE Camera Film 8 mm roll $1.50. 16mm 100' $3.00. Free processing. Better Films, 742 New Lots, Brooklyn, N. Y.

SAVE 50%! Guaranteed-fresh color, b&w movie film! 8mm, 16mm. Free catalog! Eso-H, 47th Holly, Kansas City 12, Mo.

TAPE recorders, tape. Unusual values. Free Catalog. Dressner, 69-02 174 Street, Flushing 65, New York.

RECORDERS, Tape, Wholesale. Free Catalogue. Korstan, 215 E. 88, New York 28.

WORLD'S Largest Film Selection. Features, shorts, new, used. Castle, Official, 8-16mm silent, sound. Free bargain bulletin, specify size. Peerless Camera, 415B Lexington Avenue, New York 17.

16MM Sound Films, Features, Shorts. Bedner, 5300 So. Talman, Chicago.

FREE Catalogues, 5,000 8-16MM Films. International Films, Greenvale, New York.

FREE catalog. Save $$$. Fresh 8mm, 16mm: B&W and color film. Home processing equipment. Superior Bulk Film Company, 442-448 No. Wells, Chicago 10.

1957 ROSE Parade. Ten Color Slides $1.00. Eddings, Roberts Avenue, Corning, New York.

MICHIGAN color slides. Free catalog. Hiawatha, Box 56PS, Ypsilanti, Michigan.

34 CAMERAS, PHOTO SUPPLIES

PHOTOGRAPHY For Pleasure or profit. Learn at home. Practical basic training. Long established school. Free booklet. American School of Photography, 835 Diversey Parkway, Dept. 1724, Chicago 14.

BIG Discounts on New 8MM Bell and Howell, Kodak, etc. Cameras, Projectors, Films. Also 16MM Sound. Free Catalogs. Specify 8MM or Sound. National Cinema, 71 Dey Street, New York City.

SELL your photographs to house organs. 3,000 publications buy! Free information. Gebbie Press Photos, 151 West 48, New York City.

FREE New Bargain Book! Big Savings. Central Camera Company mail order headquarters since 1899. Dept. 221, 230 South Wabash Avenue, Chicago 4, Illinois.

KODAK, Bell-Howell, Graflex, Discounts To 40%. Photo Equipment, Appliances, Free Catalog. Mailers Mart, Box 135-BK, Pelham, New York.

35 MUSICAL INSTRUMENTS, SONG WRITERS & RECORDS

ACCORDIONS—Direct from importer—save 50% and more! Free trial. Lifetime guarantee. Trades accepted. Free Catalog. Write Accordion Manufacturing Outlet, Dept. 47P, 2003 Chicago, Chicago 22, Illinois.

SONGPOEMS and lyrics wanted. Mail to: TinPan Alley, Inc., 1650 Broadway, New York 19, N. Y.

WANTED! Poems for musical settings. Write Songwriters' Service, Clifton, N. J.

POEMS Wanted For New Songs. Send Poems. Free Examination. Immediate Consideration. Songcrafters, 2724 Arcade Station, Nashville, Tennessee.

SONGWRITERS! Protect your ideas! Hold all poems, songs! Write for safe, correct procedure! Song Service, Dept. PS, 333 W. 56th, New York 19.

POEMS wanted for new songs. Send poems. Immediate consideration. Crown Music Company, 49-P West 32 Street, New York City.

SONG Poems Wanted. Five Star Music Masters, 646 Beacon Building, Boston.

TWO Songs, Publishing Plan $1.00. Box 19662, Los Angeles 19, California.

WRITE Lyrics—Improvise Melodies. Talent Guild, 168 Vanbrunt, Brooklyn 15, New York.

SONGWRITERS: Melodies furnished, records, protection. Send no songs, lyrics, or money. Free brochure. National Songwriter's Guild, 16D Ocean Shore Drive, Ormond Beach, Florida.

DISCOUNTS Instruments accessories national brands. Tempo Music, 37 Cutler, New London, Connecticut.

ELECTRIC Guitars, amplifiers, wholesale. Free catalog. Carvin, PSM, Covina, California.

ACCORDIONS Wholesale—10 day trial. Free Catalog. American Accordion Center, 5329-PS-4, Belmont, Chicago.

$2.00 EASY Piano Course $2.00. With Illustrated instructions; simplified music and Rapid Key Finders. Robbins Way-6, Box 25, Vancouver, Washington.

NEW Songwriters, Songpoets share $29 million dollars yearly. Songs composed, published, promoted by largest firm. Information, appraisal Free. Send Nordyke Publishing, 6000 Sunset, Hollywood 28PS, California.

36 RADIO, TELEVISION, SUPPLIES & EQUIPMENT

CRYSTAL—Radio experimenters. Write to Hulet, 305 Hope, Lakewood, New Jersey.

SURPLUS Mine Detectors, Radios, Radar. Amazing Picture Catalog 5c. Meshna, Malden 48, Massachusetts.

CONVERTER—Get UHF on any TV-set, regular $54.00 Radio Receptor, now $24.95 prepaid. Guaranteed new! Wisniewski, Milwaukee 7.

FREE! Giant Bargain Catalog. Transistor, "Sun" Radios, Kits, Portables, Audio, Electronics, Photographic, Optics, Tools, Household. Write Lektron, 131S Everett Ave., Chelsea, Massachusetts.

CRYSTAL radio experimenters. Please write Janecek Development Company, Dept. C, 373 East 155 Street, New York 55, New York.

CRYSTAL radio kit $1.00, preassembled $1.25, phone $1.75; catalogue. Clearco Crystal Company, 2966 North 4th, Milwaukee 12, Wisconsin.

KITS—Shortwave Radio $3.50—Crystal Radio 60c. Thousands Sold. Alliance, 2059 60th, Brooklyn 4, New York.

SUPERSENSITIVE. Single Transistor radio circuits and construction book; sun powered, miniatures, etc. All new data! Send $1.00 to: T. R. Electronics, 1465 Prospect Road, Pittsburgh 27, Pennsylvania.

ELECTRIC Guitars, amplifiers, wholesale. Free catalog. Carvin, PSR, Covina, California.

CRYSTAL Radio Experimenters write to Small Radio Lab, 1331 Tyler, Topeka, Kansas.

37 BUSINESS OPPORTUNITIES

PIANO Tuning learned quickly at home. Tremendous field! Musical knowledge unnecessary. Free information. Empire School of Piano Tuning, Champaign 2, Illinois.

IMPORT-Export! Opportunity, profitable, world-wide, mail-order business from home, without capital; or travel abroad. Established World Trader ships instructions for no-risk examination. Experience unnecessary. Free details. Mellinger, G694, Los Angeles 24.

OPERATE profitable mail order business. Write Walter Service, 4159-B East 112th, Cleveland 5, Ohio.

WE Love our mailman. He leaves over $1,000.00 monthly in our rural mailbox. My college professor husband drafted a scientific home mailorder method. We bought a Texas ranch, live as we always wanted. Now we sell the "Ranch Mailorder Method." Operates anywhere. Inquire: Eveningshade Ranch, Boerne, Texas.

BREED Rare Tropical Fish at home. Earn Big Money! Learn Secrets! Help fill huge demand. Amazing Opportunity! Free Plan. Tropical Fish Breeders, Los Angeles 61, Calif.

BE appointed state notary public now. Write—Stationers, Boerne, Texas.

FIX Typewriters. Inexpensive home course teaches Factory Secrets. Free Booklet. Write, Typewriter, Tarentum 2, Pennsylvania.

LEARN Real Estate by Listening to Records. Lee Institute, Brookline 46, Massachusetts.

WHOLESALE—Get the big merchandise-furniture, appliances, TV's, clothing, tools, auto accessories—most anything. Save half. Literature Free. Associated Wholesalers Service, 1016-C Starr, Burlington, Iowa.

BRUSH Plating Outfits for plating articles in the home and shop. No tanks necessary. Good income spare or full time. Free particulars. Gunmetal Co., Ave. E, Decatur, Illinois.

$70 WEEKLY—Home, spare time. Simplified mail bookkeeping. Immediate income—easy! Auditax, 34757D, Los Angeles 34.

11,000 NEW Prospects Daily. Baby record books, shoes, albums. Sell mailorder. Use our literature. Write: No-Co-Ro, Capitola, California.

"HOW to Start a Business" booklet sent Free! If you Know any Trade—go into business for yourself! Learn the 8 easy steps to follow. We've guided 5,000 others to success. Revealing Free Booklet yours for the asking! Write! National Business Consultant, Office AL, Los Angeles 61, California.

BECOME Tax Consultant. Graduates earn $3,000 every tax season preparing returns evenings. State approved. Union Institute, 68 Hudson, Hoboken 1W, N. J.

MAIL Order—advertising agency executive reveals sensational no-risk advertising and merchandise methods. Start in office or home—minimum capital—positive profits. Free details: Impact! 3407 Prospect Ave., Dept. 2-4, Cleveland 15, Ohio.

GROW Expensive Herbs For Us! Big Profit Home-Business of your own. Year around profitunity. We supply everything necessary! Send for Free Rare Seeds And Revealing Plan. National Herb Exchange, Dept. AL, Gardena, California.

YOUR envelopes addressed accurately, reasonably. Fast service. We have capable addressers in your city. Glenway System, Box 6568, Cleveland 1, Ohio.

MAKE Extra Money. Cash commissions. Everybody buys easy-to-sell Advertising Book Matches. Union label. Big variety—Glamour Girls, Scenics, Hillbillies. Powerhouse selling kit Free. Steady repeat business. No experience necessary. Superior Match Company, Dept. PX-457, 7528 S. Greenwood, Chicago 19.

YOU can Make Money at home in spare time taking magazine renewal subscriptions. No capital or experience necessary. All supplies furnished. Write Today! McGregor Magazine Agency, Dept. 510B, Mount Morris, Illinois.

$60 WEEKLY, spare time—easy! Home Venetian Blind Laundry. Free book. Burtt, 2434B, Wichita 13, Kansas.

ONLY new Moneymaking Plan!! We sell your products. You build luggage and cases at home—we supply instructions—materials—tools—everything. Free details. Casecraft, 807-DD Sunset, Los Angeles 12.

NEWEST Spare, full-time home business. $5 to $10 hour possible. Paint with suede—The finish with touch and eye-appeal. Beautify auto dashboards, signs, radios, toys, figurines, lamps—1001 others. Complete, step-by-step instructions sent for no risk examination. Free details. Coast, AL, Los Angeles 61.

YOUR Own name brand business. No investment; no inventory. Part time or full time. Sell famous brands of appliances, housewares, silverware, radios, vacuum cleaners, lamps, tools, clocks, watches, jewelry, etc., etc., over 1,000 items. Join thousands of successful independent dealers. Send for Free catalog and dealer price list. H. B. Davis Corp., Dept. 14, 145 W. 15 St., New York City.

FREE! "301 Profitable Small Businesses!" Amazing shoestring plans! Work home! Start spare-time! Deumant Surveys, Kenmore 23-T, New York.

PRINT for Profit at home. Amazing new method prints colorful posters, banners, greeting cards, glassware—anything. Hundreds at time. No press needed. No art. Fantastic profits! Need representative your area immediately! Free home-business plan. Screen-Print, Dept. AL, Los Angeles 61, California.

LEARN Photo-Negative (Portrait) retouching. Men, Women. $5 hour possible spare or full time at home. Easy, glamorous. Work for Photographers by mail order. Full details sent Free. Duval, 100 So. Vermont, Los Angeles 4.

POPULAR SCIENCE OPPORTUNITIES

LIQUID Rubber. Make flexible molds. Free Sample. Chaney, P.O. Box 8559, Jacksonville 11, Fla.

MAIL order business secrets revealed in simple everyday language send one dollar for complete manuscript. Albert D'Agostino, 144-17 39th Road, Flushing, New York.

AMAZING Profits in Local Mimeographing! Start on Shoestring. Merrit Mimeo, Basking Ridge, New Jersey.

MINK Raising information free. Complete Lake Superior Mink Farm, Superior E E5, Wisconsin.

SHARPEN and Service Lawnmowers $10.00 hour possible, build your own grinder, small cost, 26th year. Wirt's, 2419 Gnahn, Burlington, Iowa.

YOUR Name Wanted by Publishers, mailers. We'll list your name sent to 1000 concerns, your name on our list one year 25c. Dixie Mailers, King, North Carolina.

100% PROFIT. No Investment. Stamp brings details, samples. Miller, Box 584, Brooklyn 1, New York.

OPERATE Profitable Mail Order Business. Selling Our Mail Order Natural, Free Sample Sent Without Obligation. Write Templeton, 291 South Chase, Columbus 4, Ohio.

VENDING Machines—No Selling. Operate A Route of Coin Machines And Earn Amazing Profits. 32-Page Catalog Free. Parkway Machine Corporation, Dept. 18, 715 Ensor Street, Baltimore 2, Maryland.

START at top. No merchandise, no shipping, no postage. Slight investment. Proof: Esco, 7 W. Broad, Mt. Vernon, New York.

WHY make less than $600 monthly. UL approved portable garbage disposal unit made by multi-million dollar concern guarantees you a minimum of $44.50 clear on every $94.50 sale. No installation, works anywhere. Unlimited market. Choice territories going fast. Rush request for complete sales plan. New Home Disposal, Dept. 34, Box 840, Beverly Hills, California.

BEAUTIFUL Feather Pictures. 200% Profit! Free Details; Sample 20c Stamps. Sylvias, Apartado 9036, Mexico City.

$1,000 MONTHLY possible in collection agency business. Free details. Write Cole Associates, Syracuse 2, New York.

BUY Wholesale! Discounts to 80%! Appliances, Cameras, Sporting Goods, Housewares, Watches, Tools, Clothing, etc. Buy-Rite, Hawthorne 5, New Jersey.

TAPE Recording! Exceptionally profitable opportunity in your area. Free Information. Baron's, Lynden, Washington.

$250 WEEK cleaning venetian blinds. Patented Machinery. Free literature. Robinson, 7213A, Indianapolis 1, Indiana.

START mail order business now. 33 amazingly profitable ways. Information free. Bredin, Turley, Oklahoma.

BUY Direct From Factories—Appliances, Cameras, Watches! Free Details! Cam Company, 6808PS 20th Avenue, Brooklyn 4, New York.

INVESTIGATE how you can earn up to $2000.00 or more monthly with automatic hot beverage and food dispensers. Proven plan. No obligation. Information free. Superior, 4555-G East Warren, Denver, Colorado.

$18.00, $36.00 WEEKLY possible. Handpainting novelty Plates. Flocraft, Farrell, Pennsylvania.

MODERNIZED Light Fixtures For Ugly Chain Types, No Cost, Plans 50c. Voltamps, 1839 E. 13, Philadelphia 45, Pennsylvania.

$10.00 PER Hour Net Profit In Monument Cleaning Business. Free Details. X-Pert Monument Cleaning Company, 466 Potomac, P S. 3, Buffalo 13, New York.

AUTO Mechanic? "down to earth" moneymaking idea! $1.00! Greenthird, 8332 Sagamore, Kansas City 15, Missouri.

FREE! "How To Turn Rags Into Riches!" Metro, Dept. C, Box 151, Oak Park, Illinois.

FREE Folder: "How to Make $3,000 Yearly, Spare Time, Backyard, Raising Earthworms!" Oakhaven-42, Cedar Hill, Texas.

PLASTERCRAFT molds, liquid rubber, plasters, flocks, candle supplies. Catalog and manual free. Jayhawk Plasters, Blue Rapids, Kansas.

CASH from Sawdust (seventy methods). Tin-cans (thirty methods). Newspapers (eighteen methods). Instructions 50c each. All three $1.00. Charles Company, 12-EXV, Norwood, Ohio.

MAKE attractive, durable, building plastic, easily. 800% profit. Exclusive district. Bays Laboratory, Oklahoma City 9.

MAKE Perfumes—Cleaners—Polishes—Cosmetics—Sell Mailorder—International, 6347 Parnell, PS-47, Chicago 21, Illinois.

"MAILORDER Laws and Regulations", $1.00. Explains necessary licenses, different taxes, legal requirements, etc. "Mailorder Rules for Beginners", $1.00 additional. Tasker, 1603 Peach Street, Alexandria, Virginia.

FREE "Franchise Profit Letter" describes nationwide opportunities. Exclusive distributorships, dealerships, agency operations. Write today. National Franchise Reports, 333 North Michigan, Chicago 1.

PRINTING, Office Supplies wholesale. Save 50%. Royal, Box 368-S, Cleveland 27, Ohio.

TO $100.00 weekly, Sparetime, home operated mailorder business. Successful "Beginner's" plan. Everything supplied. Lynn, 10420-C National, Los Angeles 34.

IMPORT your own products in small lots. Also, start profitable mail order business using International Dropshipment method. Capital unnecessary. Free details. Ga. Overseas Trading Co., Dept. D.3, 715 Persons Bldg., Macon, Georgia.

OPPORTUNITY to earn $15,000-$30,000 annually. Franchise protected. Granted on $12,500 basis. Live at home. No merchandise to buy. Selfemployed. One of most exclusive and noncompetitive Businesses in United States and Canada. Send for free explanatory booklet. Harrell and Company, Box 5-D, Louisville, Illinois.

REBUILD batteries; Make rubber stamps; Repair dolls. Catalog "60 ideas" free. Universal, Box 1076-B, Peoria, Illinois.

MAKE flexible molds. Cast plaques, figurines. Free sample. Tooker, 1045-A Fairview, Hamilton, Ohio.

SPECIALIZED Magazines—5,166 publications—current copies. Also 1,148 Self-help Books. All trades, professions, sports, hobbies, etc. List Free. Publications, 348 North Ritter, Indianapolis 19, Indiana.

UNUSUAL mailorder opportunity. Tested. We supply everything. Gerard's, Azusa, California.

BIG Money Raising Fishworms and Crickets. Free Literature. Carter Worm Company, Plains, Georgia.

LIQUID molding rubber, extra thick. Free sample. W. Wooley, 1016-B, Donald, Peoria, Illinois.

CANDIED Popcorn and Potato Chip Equipment. Eakins, Box 933-B7, Springfield, Ohio.

MAKE New Greaseless Doughnuts In Kitchen. Sell stores. Free recipes. S. Ray, 3605 South 15th, Minneapolis 7, Minnesota.

OPERATE Your Own Merchandise Mailorder Business. Everything furnished! C. Mann, Woodcliff Lake, New Jersey.

BUY Wholesale! Resell at Big Profits. Brand name merchandise—Appliances, cookware, housewares, watches, jewelry, dry goods, clothing, sporting goods, toys, gifts, etc. Free 1957 color catalog with confidential cost sheet. Merit Home Products, Dept. PS-4, 107 Manhattan Ave., Brooklyn 6, New York.

POWER Lawnmowers—$39.00. Wholesale. Moneyback guarantee. Smith Agency—PS, Excelsior Springs, Missouri.

PLEASANT Profits—Let us show you how to start your own complete scissors and tool sharpening business. Free details. Serr-Edge Inc., 9733 Lorain, Cleveland 2, Ohio.

SENSATIONAL profits with Local Mimeographing. Exclusive secret plans exposed! Start free. Mozelle Mimeo Studio, Bonham, Texas.

EARN $10,000 yearly raising Angora Rabbit Wool for us. Information, 25c coin. American Angora Company, Malta 1, Mont.

MAIL Order—Home Business Bulletin. Plans, ideas. Copy 25c. Townsends, 1018 Woodland, Sharon Hill, Pennsylvania.

$250 WEEK reported! Free book "506 Odd, Successful Businesses." Work home! Expect something Odd! Pacific-36C, Oceanside, California.

START Profitable Mailorder House: Proven Products, Magazine. Confidential Details. Barnes, Box 226-A, Portsmouth, Virginia.

BRIKCRETE complete equipment, franchise. Make offer. Grasso, 119 Ridge, Rome, New York.

FREE Wholesale Catalog Vitamins, Minerals Concentrates. National Diet Products Company, Portland 2, Oregon.

SAVE 20% to 50%. Buy wholesale. Nationally advertised merchandise. Free details! Beecher Sales, Box 2161-E, Cincinnati 1, Ohio.

COLORGLAZED Concrete pottery made without molds. Patented method. Cemetery products, novelties, tiles. Basement leak-sealing. Money-making projects. Booklet, details free. Men only. National Potteries, Grand Rapids, "Minnesota."

EARTHWORM Growers Needed! Send for Free Booklet "How You Can Make Money Raising Earthworms!" National Worm Co-Op, 4163 Pedley Avenue, Norco, California.

OVER 40? Enjoy financial security. Details. Chester, Box 865-A, Sea Cliff, New York.

"EVERYBODY Likes Candy." Make professionally home. (Our 45th Year.) Ragsdale Candies, East Orange, N. J.

SENSATIONAL profitable home operated business now available. Part or Full time. Experienced unnecessary. Request information. General Associated, 119-E South Western, Los Angeles 4, California.

EXCLUSIVE Distributorship available in most areas for world-famous Cadmium Battery guaranteed to outlast your car. Tremendous profit opportunity. Investment for merchandise only. Free franchise. Cadmium Battery Corporation, Dept. 103, El Segundo, California.

THEY hand him $100! Free Plan "Secret Journal Hidden Dollars." Work home! Publico-R6, Oceanside, California.

MAKE Big Profits clipping newspaper items for publishers. Instructions explain how. Particulars free. National, 81-N, Knickerbocker Station, New York.

OPERATE Your own mail order discount business at home spare time. Sell gifts, appliances, housewares, cookware, cutlery, dinnerware, silverware, jewelry, watches, etc. at discounts to 75%! No stock investment. We ship your orders under your name. Catalog, sales letters, order blanks, envelopes printed with your name can cost you nothing. Postcard brings free sample catalog, all details. Topval Corp., Lindenhurst 121, New York.

$3500.00 FROM your lawn, growing Meyer Zoysia Grass. Book 25c. Emerald Nursery, 12076 Bellefontaine, St. Louis 15, Missouri.

MAKE $46 From Square Foot Plywood; Jigsaw necessary. Free Information. Woodarts, P-7, Bridgewater, Massachusetts.

COLOR Concrete with chemicals. Marble-glaze cement benches, pottery. Homeshop. Hundred beautiful designs, made without molds. Birdbaths to waterfalls. Your chance for fame, fortune. 10c brings sample, pictures. Hollywood Cementcraft, 8527-X Wonderland, Hollywood 46, California.

$$$$GROW Mushrooms. Cellar, shed. Spare; full time, year round. We pay $3.50 lb. We have over 25,000 customers. Free Book. Mushrooms, Dept. 178, 2954 Admiral Way, Seattle, Washington.

FREE Folio "$5,000-$45,000; Unlimited Vacations." No merchandise, equipment. Unknown! Work home—sparetime! Haylings—S-16, Carlsbad, Calif.

LIQUID Marble—Brushed! Sprayed! Mold novelties, tile! Particulars free. Marbelizing Service, Edwardsville, Illinois.

EARN Money with your car 10 plans 50c. Robert Anderson, 15 Park Row, New York 38, New York.

MUSHROOM Spawn Plus Newest Manureless growing; marketing methods $1.00. Free Particulars. Mushrooms, 641 South 19th, Newark 3, New Jersey.

PLATE Baby Shoes, jewelry, gifts, bronze and colored pearl. Free booklet. Anderson, 11029 South Vermont, Los Angeles 44.

POPULAR SCIENCE OPPORTUNITIES

FREE Cadillac, $10,000 yearly. Cars, appliances wholesale. Strateway, 6228B, Charlotte 7, North Carolina.

GROW Orchids at home—profitable—fascinating. Year 'round. Maine to California. No Greenhouse. Successful home grower shows you how to provide proper temperature and air conditions in any well lighted room. Full details & real Orchid Seeds Free. Orchidland, 100 So. Vermont, Los Angeles 4.

LEARN Appliance Service and Repair. Motors, Washers, Refrigeration, Cleaners, everything. Free Booklet. Armstrong, 11027-B South Vermont, Los Angeles 44.

38 MONEYMAKING OPPORTUNITIES

SELL Titania Gems; far more brilliant than diamonds. Catalog 10c. Diamonite, 2420-S 77th, Oakland 5, California.

MEN—Women! Start Money-Making Plastic Laminating Business at home in spare time. Material that costs 11c brings back $2.50. No canvassing or selling but mail orders bring in $20 a day. Write for full particulars Free. Rush name on postcard to Warner, Room 8-D, 1512 Jarvis, Chicago 26, Illinois.

DETECTIVES—Work home—Travel. Experience unnecessary. Detective Particulars free. Write. Wagoner, P-125 West 86th, New York 24.

$60 WEEKLY spare time—easy! Home Venetian Blind Laundry. Free book. Burtt, 2434B, Wichita 13, Kansas.

YOU can Make Money at home in spare time taking magazine renewal subscriptions. No capital or experience necessary. All supplies furnished. Write Today! McGregor Magazine Agency, Dept. 510C, Mount Morris, Illinois.

START Big-Pay business at home in spare time. No experience needed to operate little table-top machine for bronzing baby shoes. Make $5.46 profit on every pair. Full particulars free. Send postcard to Mason, 1512 Jarvis, Room 8-D, Chicago 26, Illinois.

FREE! "301 Profitable Small Businesses!" Amazing shoestring plans! Work home! Start sparetime! Deumant Surveys, Kenmore 23-T, New York.

MEN and women wanted to start home business in spare time with little table-top rubber stamp machine. Easy to earn up to $9.80 an hour without previous experience. Full particulars Free by mail. Send postcard to Roberts, 1512 Jarvis, Room 8-D, Chicago 26, Illinois.

VENDING Machines—No Selling. Operate A Route of Coin Machines And Earn Amazing Profits. 32-Page Catalog Free. Parkway Machine Corporation, Dept. 19, 715 Ensor Street, Baltimore 2, Maryland.

KILL Pests For Profit! New shortcut methods. Rid homes, farms, resorts, businesses of termites, roaches, rodents, etc. Ideal spare, full time business. Nationwide need. Huge profits! Free Business Plan. Contrex, Dept. C, 429 South Western Avenue, Los Angeles 4, California.

MAKE top money collecting Snakes, Lizards, Turtles, Toads, Frogs. We pay guaranteed prices. Details 25c. Biological Exchange, Dept. 121, Box 5302, El Paso Texas.

BUY Wholesale! 30-80% Discounts! Appliances, Gifts, Typewriters, Tools, Watches, Sporting Goods, Jewelry, Cameras, Housewares, etc. Consolidated Distributors, Clifton 11, New Jersey.

60% PROFIT Cosmetics $25 day up. Hire others. Samples, details. Studio Girl-Hollywood, Glendale, Calif. Dept. 1174H.

TEN Automotive products with formulas. Easily made, tremendous Profit $1.00. Professional Mens, Box 4194, Tulsa 9, Oklahoma.

HOW To Raise Money Quick!! And Continue Making Money: Details 25c. Baker, Box 108-S, Sugarland, Texas.

LEARN Technical Metaphysics and insure your future. Easy, inexpensive correspondence course. Simplest method known. Diploma. Write: Premier College of Technical Metaphysics, 2532 McKenzie St., Vancouver 8, B.C., Canada.

DOLLARS Every Day! Amazing Magic Mailorder Plan. Setup Free. Miller, Box 588-A, Oshkosh, Wisconsin.

FREE. Latest Money making opportunities. Work Home. Opportunities, 815 W. 59th St., Chicago 21, Illinois.

BUY It Wholesale 30 to 80% discounts. Brand named nationally advertised merchandise. Giant catalog 98c. Clark Sales, Dept. 2, 6315 Whitewood, Detroit 10, Michigan.

BIG Profits From Post Cards. 50c Brings Details. Marjen, 1109 Balmoral, Chicago 40, Illinois.

MAIL Postcards Receive Dollar Orders. Keep Dollars. Details Free. Gryders, Box 187, Barberton, Ohio.

AMAZING successes through franchises! Become exclusive franchise holder your territory. Information rushed. National Franchise Reports, 333 North Michigan, Chicago 1.

BIG Money raising fishworms and crickets. Free Information. Carter Farm-11, Plains, Georgia.

MAKE Money Clipping Newspaper Items For Publishers. Detailed plan Newscraft, PS-983-E, Main, Columbus 5, Ohio.

SELL Books by mail. 400% Profit. Royal, Box 368-M, Cleveland 27, Ohio.

WHOLESALE! Sell yourself—sell neighbors Aluminum Awnings: Beautiful baked enamel finish. Write: Groff, Box 10294, Tampa, Florida.

BUY Wholesale! Save 66-2/3%! Appliances, Furniture, Jewelry, Toys, Sporting Goods, Tools. Free Catalogs. National Buyers Service, Box 3336FB, San Francisco.

$10.00 HOUR Possible spare time. Repair electric irons. Learn hidden tricks. Complete course $2.00. Basis for other appliances. Oriole, 1101 W. Baltimore, Baltimore 23, Maryland.

"HOW To Win Prize Contests". Free Information. National, 9128-S S.W. 26th, Portland 19, Oregon.

$20.00-$50.00 WEEKLY from sparetime mimeographing. Write: Mozelle Mimeo, Bonham, Texas.

REVOLUTIONARY New Real Estate Service. Operate from your home. No investment, no selling. $2.00 Booklet tells how. Miller, Dept. A, Box 6253, Oklahoma City 11, Oklahoma.

LAMINATING Kit, Moneymaking Instructions $1.00. Annibale, Box 573, Scranton 2, Pennsylvania.

FREE Folio $5,000-$45,000; Unlimited Vacations." No merchandise. Unknown! Work home—sparetime! Haylings—S16, Carlsbad, Calif.

ESTABLISH Profitable Business, Spare Time, Sell Popular Household Items At Big Discounts. Full Details Free. S-M Distributing Company, Box 43-AP, Cleburne, Kansas.

FREE booklet "Enjoyable Paying Hobbies." Let me help you. Laura Dickson, 1804 Green St., Columbia, South Carolina.

WE establish you in your own mail order discount business. Supply catalogues, sales materials printed your name and drop ship your orders. Sell gifts, appliances, watches, housewares, silverware, cookware, etc. at discounts to 75%. Catalog, details free. Topval Corp., Lindenhurst 122, New York.

AGED Homeworker Nets $100 weekly! Free Plan "Secret Journal Hidden Dollars." Work home! Publico-R7, Oceanside, California.

TYPE For Pay. 25-ways Instructions 50c. Refundable. Empire 1513-PS-1 Charlotte, New York 60.

MAKE Big Profits clipping newspaper items for publishers. Instructions explain how. Particulars free National, 81-N, Knickerbocker Station, New York.

HOTTEST Mail Order Plan Ever! Sell Photos, Films, Art Novelties. Huge proven profits! Free Details! Ampro, Dept. 2, 429 South Western Avenue, Los Angeles 5, California.

BUY Nationally Advertised Brands Coffee For 50c Pound. Send 50c For Full Details. Ed Bushman, 739 Racine, Racine, Wisconsin.

OUTSTANDING opportunities with mail order franchise. Details free. Miller, Box 67, North Manchester, Indiana.

$$$$GROW Mushrooms. Cellar, shed. Spare, full time, year round. We pay $3.50 lb. We have over 25,000 customers. Free Book. Mushrooms, Dept. 179, 2954 Admiral Way, Seattle, Washington.

TYPISTS! Make money at home! Mailers, 2 Madison, Greencastle, Indiana.

FREE Book "505 Odd Successful Businesses." Work Home! Pacific-35c, Oceanside, Calif.

FREE Mushroom Facts. Newest developments simplify growing; marketing. Mushrooms, 641 South 19th, Newark 3, New Jersey.

"97 MONEYMAKING Opportunities," for $2.00. Make quick, easy money, home! Central Business Efficiency 3, 838 N. New Jersey, Indianapolis, Indiana.

38A BUY IT WHOLESALE

BUY Wholesale! Discounts to 80%! Appliances, Cameras, Sporting Goods, Housewares, Watches, Tools, Clothing, etc. Buy-Rite, Hawthorne 8, New Jersey.

WHOLESALE Catalog! 30-80% Discounts! Appliances, Tools, Housewares, Jewelry, etc. Midwest, 156-CPE, Pontiac, Illinois.

BIG Multicolor Wholesale Catalog! Housewares, appliances, clothing, silverware, cookware, luggage, binoculars, radios, phonographs, cameras, recorders, projectors, typewriters, shavers, sporting goods, toys, tools, sewing machines, watches, jewelry. Name brands. Huge discounts. Just postcard: Selbyco, Decatur 167, Illinois.

NEWLYWEDS. Quality name brand merchandise, appliances, tools, jewelry, clothing, housewares, etc., catalog $1.00. Refunded first order. Dru-Al's Sales, Box 5, East Chicago, Indiana.

ELECTRIC Guitars, amplifiers, wholesale. Free catalog Carvin, PSW, Covina, California.

FREE. 25 wholesale catalogs, list 25c. Bartz, 912-B Autumn, Albert Lea, Minnesota.

39 FORMULAS, PLANS, ETC.

FORMULAS—All kinds. Latest products. Literature free. Kemico, Park Ridge 15, Ill.

LATE Modern Manufacturing Formulas List Free. Chemical Service, Martville, New York.

SAVE dollars. Clean your hands with Bevco waterless hand cleaner. Finest quality. Sixty cents gallon. Mix two minutes. Two materials everywhere. Hands soiled? Use Bevco. Copyrighted formula $1.00. M.O. Bevco Chemical Specialties, Box 466, Kalamazoo, Michigan.

FREE Formula Catalog. Anything Analyzed $35.00. Western Chemical, Salem, Oregon.

ANY Formula $3.00. Catalog—Manufacturing Treatise 10c. J. Belfort, 192 N. Clark, Chicago 1.

68 MANUFACTURING Formulas, for $2.00. Easily make profitable, fast selling, standard products! Central Efficiency 3, 838 N. New Jersey, Indianapolis, Indiana.

40 PLASTICS

LEARN Plastics Fabrication For spare time income. Low cost home training now available. Write for free booklet. Interstate Training Service, Dept. D-2, Portland 13, Oregon.

PLEXIGLAS—Cut to size—Clear—Any thickness — Colors — Rods — Tubing. Mc. Clarin Plastics, P. O. Box 168B, Hanover, Pa.

LAMINATING Supplies. Price List Free. Solomson, 46 Cornhill, Boston 8, Mass.

NEW Liquid Casting Plastic, clear, colors. Embed real flowers, coins, photos. New Manual shows fine things you can make at home and sell at big profit. Send 25c. Castolite, Dept. D-102, Woodstock, Illinois.

PLEXIGLAS, Square foot cost. 1/16"—$1.18; 1/8"—$1.52; 3/16"—$1.86; 1/4"—$2.21; 3/8"—$2.23; 1/2"—$4.36. Colors add 10%. Send 15% for postage. Aristocrat Plastics, 23-25 Sussex Ave., Newark, New Jersey.

REPAIR kit welds broken or cracked plastic. Restores original finish. $1.00 prepaid. No. C.O.D. Raither Co., Box 264, Station B, Toledo, Ohio.

PLEXIGLAS, Fiberglas, Polyester, Acetate. Instructive Wholesale-retail catalog —free! Gem-O'-Lite, 5529 Cahuenga, North Hollywood, California.

POPULAR SCIENCE OPPORTUNITIES

CREATE Colorful Tiles, Mosaics, Jewelry with new Castoglas for yourself, gifts, profit. No tools, heat, experience needed. Manuals 10c each. All three only 25c. Castolite, Dept. DT-102, Woodstock, Illinois.

41 CHEMISTRY & PHYSICS

ILLUSTRATED Catalog: Chemistry, mineralogy, biology 20c. Tracey Laboratories, Evanston, Illinois.

BIOCHEMICALS — Hormones, Nucleo-Proteins, Amino acids, and Vitamins. Literature 10c. Royal Scientists of America, RD#4, Towanda, Pa.

CHEMICALS and apparatus for industrial, analytical and private laboratories. Catalog 25c. Dept. M-28, Biological Supply Co., 1176 Mt. Hope Ave., Rochester 20, N.Y.

HOME laboratory and apparatus kits, Laboratory supplies. Catalog 25c. Established 1931. John H. Winn, 124B West 23rd Street, New York, N. Y.

CHEMICALS, Glassware Catalog, 25c. Laboratory Sales, Box 161-F, Brighton, Massachusetts.

60 PAGE Booklets! "Beginners Chemistry," "Chemistry," "Physics," "Relativity," "Light," "Astronomy," "Electricity," "Radio," "Useful Tables," "Scientific Oddities," 10c Each. Franks, 3121 South Racine, Chicago 8.

AMAZING New Book of Science. Experiments, Formulas and Catalogue of Laboratory Supplies. Only 25c. National Scientific Co., Dept. PS-4, 500 W. Road, Lombard, Illinois.

42 HELP WANTED

FOREIGN Jobs—Latin America, Alaska, Canada, up to $1500 monthly. Up-to-date 1957 Foreign Service Directory gives complete information; hot list of firms hiring for Military and Civilian Construction, Aircraft, Oil, Exporters—Importers, Mining. $1.00. How-When-Where to apply. 9th successful year! Global Reports, Box 883-P, Hollywood 28, Calif.

COPYRIGHTED Reports on best paying jobs with travel, adventure, promotions. Construction, aviation, shipping, laborers, clerical, trades, supervisory, factory, unusual opportunities. Many types of work. Skilled and unskilled. Foreign and stateside openings for men and women. Only $2.00 ($2.25 airmail), including registration-advisory service. Satisfaction guaranteed. Included absolutely free: Special reports on Alaska, Spanish airbase construction, South American opportunities and husband-wife foreign jobs. Research Services, Suite 207-PSL, Brown Building, St. Louis 5, Missouri.

JOBS on ships and yachts going to foreign countries. Davenport Seamens Service, Box 1354, GPO, New York 1, New York.

JOBS On Ships! Experience Unnecessary. Transoceanic, Box 494, Baltimore 3, Maryland.

SOUTHERN California opportunities unlimited. World's largest classified airmailed $1.00. World Wide Co., 8418 Canby, Northridge, California.

NORTHWEST Opportunities Portland or Seattle Sunday Classifieds. Your choice $1.00. Richard Harris, 649 N.E. Ainsworth, Portland 11, Oregon.

WESTERN Dude Ranch jobs. Cattle ranch jobs. Full active list for $2.00. Carefully chosen ranches. Copyrighted surveys tells all. Free room and board and good pay. Need wranglers, horseshoers, cooks, waitresses and cabin girls. McCue, R-1, Veneta, Oregon.

CALIFORNIA! Help wanted; Rentals, Real Estate and Business Opportunities columns airmailed 50c. Chesley, 3977½ Texas St., San Diego, California.

AUTHENTIC Alaska Information, Jobs, Wages, Housing, Complete Economic Data $1.00. Alaska Information, Box 3, Ketchikan, Alaska.

SEATTLE. Immediate Openings. Men, Women, Good Pay, Great Opportunities. Listings $1.00 Personal Commentary $2.00. Johnston, 2809 Portland St., Seattle 8, Washington.

WANT work in Washington? Good jobs available. Write immediately. Particulars Absolutely Free. Henderson, 170 Temple Village, Alexandria, Virginia.

ST. Lawrence Seaway has Midwest Booming! Jobs plentiful. Latest Classifieds Airmailed. $1.25. Faddock, P.O. Box 121, Hales Corners, Wisconsin.

WASHINGTON, D.C. or Philadelphia, Pennsylvania. Classifieds. $1.00 each. Cousins, R-6, Box 62, Alexandria, Virginia.

FOREIGN, Alaskan, USA jobs!! To $1500 Monthly! Million Americans, Employed Overseas. Copyrighted Reports. Who to contact for highest paying jobs. Laborers—Trades—Truck Drivers—Office—Engineers, Many Others. 32 Countries—St. Lawrence Project, Spain, Latin America, Northern Projects, Europe. Year Registration—Advisory Service. Application forms. Unconditional Money-back guarantee! $2.00 (Airmailed $2.25) (COD's Accepted). International Reporter, St. Louis 1-SS, Missouri.

CALIFORNIA, Santa Clara Valley—jobs, Industrial opportunities, information, latest Classifieds, Airmailed $1.00. Elwood West, 15309 Charmeran Ave., San Jose 24, California.

TRUCK drivers, laborers, helpers, craftsmen over $1000.00 monthly far northern bases. Also information South America, Spain, Alaska, etc. For foreign job listing send $1.00. Universal, 1111 Commerce Bldg., St. Paul 1, Minnesota.

BUFFALO: Growing Seaway, Throughway Transcourse. Classifieds $1.00. Other Services. Elliott, Box 232, Hamburg, New York.

JOBS Paying to $350 weekly now available on overseas and American projects. Men and women. All trades. Transportation paid. Free information. Write Transworld, S4, 200 West 34th Street, New York, N. Y.

43 AGENTS WANTED

YOUR own business—Suits $1.50; Overcoats 65c; Mackinaws 35c; Shoes 12½c; Ladies' Coats 30c; Dresses 15c; Enormous profits. Catalog Free. Nathan Portnoy Associates, 605-J West 12th Place, Chicago 7.

AGENTS—300% profit selling genuine gold window letters; stores and offices. Free samples. Metallic Sign Letter Co., 1217-E West Newport, Chicago.

START Your Own Business On Credit. Your own boss. 1598 Dealers sold $5,000 to $32,000 in 1955. We supply stocks, equipment on credit. 200 home necessities. Sales experience unnecessary. Pleasant profitable business backed by world-wide industry. Write Rawleigh's, Dept. D-U-PSC, Freeport, Illinois.

GOLD or Silver letters, numbers. Windows, Doors. Trucks 1" to 6". 500% Profits—Free Samples. Atlas-U, 544 West 79th, Chicago 20.

NEW Jobs open in selling! Send name, address for five free issues of Opportunity Magazine's money-making guide, listing hundreds of companies who'll pay you well, full or part-time. No experience needed. Opportunity, 850 N. Dearborn, Dept. 18, Chicago, Illinois.

GOLDMINE Of 600 money-makers. Copy Free. Specialty Salesman Magazine, Desk 6-B, 307 N. Michigan, Chicago 1.

EXCLUSIVE line of personal initialed buckles, belts, cap badges, 3,000 emblems, etc. Hook-Fast, Dept. PS, Roanoke, Virginia.

$1,000.00 A month for making dramatic 3-second demonstration of amazing lightweight Presto Fire Extinguisher. New chemical used by airforce snuffs out fires instantly. Only $4.95. Terrific commissions. Millions want it. Free Kit. Merlite, 114 E. 32nd, Dept. P-77U, New York 16.

GET New Shirt Outfit Free: make $90.00 weekly on 5 average orders a day. Famous quality Made-To-Measure dress and sport shirts at $3.95 up sell fast to all men. No experience needed. Full or part time. Write: Packard Shirt Co., Dept. 458, Terre Haute, Indiana.

CALIFORNIA sweet smelling beads, sensational sellers. Particulars free. Mission, 2328-P West Pico, Los Angeles 6, Calif.

FREE! Beautiful Feather Pictures 200% Profit! Apartado 9036, Mexico 1, D.F.

WILL you wear new suits and topcoats without one penny cost and agree to show them to friends? You can make up to $30.00 in a day even in spare time without canvassing. Stone-Field, 532 South Throop St., Dept. G-926, Chicago 7, Illinois.

CALENDARS, Advertising Novelties, Matches. All styles, including Religious. Varnished 12 sheet. Girls. Hundreds of Advertisnig Novelties, Book Matches, etc. Fleming Calendar Co., Promotional Division, 6539 Cottage Grove, Chicago 37, Ill.

60% PROFIT Cosmetics $25 day up. Hire others. Samples, details. Studio Girl-Hollywood, Glendale, Calif. Dept. 1174H.

WHOLESALE Buyers, Salesmen, Dealers! Get the "original" Blue-Book Directory. America's finest. Lists 6500 Jobbers, Manufacturers, wholesalers who supply anything. Also new products. Free details. Associated Wholesalers, 1016-CY Starr, Burlington, Iowa.

BUSINESS Kit Free! Postcard puts you in business! Complete line, 160 shoe styles, also jackets. New discoveries pay Big commissions. No investment. Send for Free Kit. Mason Shoe, Dept. C-51, Chippewa Falls, Wisconsin.

SALESMEN—Put yourself in line for big money, real future. Keep stores supplied with self-selling 5c-$1.00 carded merchandise. Nationally advertised. Top profits for you and merchants. Liberal deals boost sales. Sideline or full time. World's Products, Dept. S3-F, Spencer, Indiana.

DRYCLEANS Clothing for only 10c per garment. Lightning seller. Saves drycleaning bills. Samples sent on trial. Kristee 65, Akron, Ohio.

AGENTS! Dealers! Sell our Readicut Dress Kits—85% profit. Use our literature, sure-fire mail order plan. Readicut Manufacturers, Loganville 82, Wisconsin.

AMAZING New Waterless Hand Cleaner. Removes grease, paint, dirt. Sells fast. Unlimited market. For free sample and literature, write to Highlander Chemical Co., Box 66, A.A.S., Omaha, Nebraska.

AMAZING unbreakable plastic housewares, containers, tablecloths, drapes, utility covers. Nationally advertised! Sell by themselves! Largest selection! Free catalog P874. Acclaim, Box 4, New York 40, New York.

CALLING On Businessmen? Double your Profits with exclusive advertising-embroidered uniforms, jackets, pants, shirts, coveralls, sportswear. Every business big-order prospect! Free Outfit. Master Co., B-29, Water, Ligonier, Indiana.

RETRACTABLE Ball Pens $2.00 Dozen. $15.50 Gross. Refills $1.00 Dozen. Bonomos, 54 Jefferson St., Brooklyn 6, New York.

BIG Profits, selling ties ($2.00 value). $6.50 dozen. Free catalog. Empire Cravats, 611-PS Broadway, New York 12.

WHOLESALE! Sell yourself—sell neighbors Aluminum Awnings: Beautiful baked enamel finish. Write: Jim, Box 10254, Tampa, Florida.

A Successful Mail Order Business is based on the product. We have that product. The Five Star Wonder Tool is demonstrated and sold on T.V. for $1.98. It sharpens knives, scissors, lawn mowers, axes, sickles, etc. It cuts glass like a diamond. We have priced these tools very, very low because we only want to do business with people wanting to re-sell them at a profit. Send $1.00 for two samples, $5.00 for a dozen, $48.00 for gross. We pay postage. Firms wanting to promote this tool on T.V., send $25.00 for a 3 minute commercial made by a fast talking demonstrater who can really cut glass. But—don't go in T.V. unless you are equipped to handle a lot of orders. You will be amazed how fast you can sell these tools. They are in demand and people are buying them. We have other fast-selling promotional items. Send for circular. Albert Cahill Steel and Iron Works, Adams Avenue, Toms River, New Jersey.

EASY handwork makes fast-selling articles. Sample free. Sunmade Company, Brockton 64, Massachusetts.

BUY Wholesale! 100,000 Name Brand Products! Save 66-2/3%! Big profits selling others spare time! Free Catalogs. National Buyers Service, Box 3338FE, San Francisco.

BIG, Easy Commissions taking orders for beautiful Door Name Plates! Home owners buy like mad! Sure-fire, money-maker! Sample Plate and complete details Free! Zax Corp., Box 401-D, Nashua, New Hampshire.

EVERY man a prospect. Request free sales kit. Show line of belt buckles, individualized with customer's name and emblems also transportation, police, fireman badges. Choice 3,000 emblems. Hook-Fast, Box 1425-PS, Providence, Rhode Island.

POPULAR SCIENCE OPPORTUNITIES

SELL What Everyone Buys! Wholesale Catalog $1.00. Imports, General Merchandise. Nelson's Import Specialties Company, 3773 30th Street, San Diego 4, California.

TWINFONE For Two Party Telephone Listening. Improves Telephone Reception. Sample $1.40. Big profits. Write Telephone Devices, Lynbrook, New York.

HOW Much Money can you make with amazing new product giving 58% more power, 54% gas saving, to cars, trucks—proved by Laboratory Test. $1,500 in month possible. Write for free money-making plans and proof. Pope Chemical, 224 W. Huron, Dept. S-50, Chicago.

NAMEPLATES for Homes, Business, Desks. Free Samples. Whitney Plates, West Springfield, Massachusetts.

$1.00 PROFIT selling $2.95 photo enlargement offer. Allen Studio, Reigler Bldg., Little Rock, Arkansas.

44 HIGH-GRADE SALESMEN

$1,000.00 A month for making dramatic 3-second demonstration of amazing lightweight Presto Fire Extinguisher. New chemical used by airforce snuffs out fires instantly. Only $4.95. Terrific commissions. Millions want it. Free Kit. Merlite, 114 E. 32nd, Dept. P-77U, New York 16.

MAKE Extra Money. Cash commissions. Everybody buys easy-to-sell Advertising Book Matches. Union Label. Big variety—Glamour Girls, Scenics, Hillbillies. Powerhouse selling kit. Free. Steady repeat business. No experience necessary. Superior Match Company, Dept. P-457, 7528 S. Greenwood, Chicago 19.

AD Matches! Sell amazing designs—10, 20, 30, 40, and 240-light book matches. Bigger spot cash commissions; every business a prospect. Low prices for high quality. Repeats. Start without experience; men, women; full, part-time. Buy nothing. Sales kit furnished. Match Corp., Dept. PS-87, Chicago 32, Illinois.

MAKE $5 hour. New. Write Noiseless, 220 Edison, Salt Lake, Utah.

45 EDUCATIONAL & INSTRUCTION

USED Correspondence Courses and Books sold and rented. Money back guarantee. Catalog Free. (Courses Bought.) Lee Mountain, Pisgah, Alabama.

BE a Real Estate Broker. Study at Home. Write for Free book today. GI approved. Weaver School of Real Estate, 2018R Grand, Kansas City, Mo.

COMPLETE Your High School at home in spare time with 60-year-old school. Texts furnished. No classes. Diploma. Information booklet free. American School, Dept. X446, Drexel at 58th, Chicago 37, Illinois.

STUDY For Doctor's degree of Psychology, Metaphysics and Divinity. Correspondence courses only. College of Divine Metaphysics, Dept. P-S, 2811 North Illinois, Indianapolis 8, Ind.

EARN While You Learn Auto And Diesel Mechanics. Master this top paying trade. Many graduates earn $100 a week and up. Approved for Korean veterans. For free information write Dept. No. 262, Nashville Auto-Diesel College, Nashville 3, Tenn.

HIGH School diploma at home. Licensed teachers. Approved materials. Southern States Academy, Box 144 PX, Station E, Atlanta, Georgia.

ENGINEERING Degrees earned by home study (Residence classes also available.) Pacific International University, (American College of Engineering), Box 27724-A, Hollywood 27, California.

WANT A Diesel Job? New Opportunities to increase income. Higher Pay, More Money. We can help you Qualify. Tools Shop method home training. Write today! Diesel, Tractor, Heavy Equipment Division. Interstate Training Service, Dept. B-2, Portland 13, Oregon.

WELDING training pays at Hobart Welding School, Box P-471, Troy, Ohio. VA contract. Best equipment. Catalog free.

BOOKKEEPERS! Increase your earnings! Operate your own simplified "Dollar-A-Week" Bookkeeping and Tax Service. Full or spare time. Details Free. No obligation. Ellis, Box 203, Cedar Grove, North Carolina.

LEARN While Asleep! Details Free. Research Association, Box 610-K, Omaha.

HOW to Write short stories, mysteries, articles. Learn at home for career or extra part-time income. Graham Doar sold one story to Post, CBS Radio, and NBC-TV. Professional writers show you how. Send today for free lesson and book. Palmer Institute of Authorship, Desk UM-47, 1680 N. Sycamore, Hollywood 28, California.

SIMPLIFIED Analytics teach algebra clearly, instantly—guaranteed. $1. Ziemba, I-6123 Orchard, Dearborn, Michigan.

QUALIFY for college equivalence degrees by examination. No courses. Increase opportunities for promotion, better pay. Approved by employers and educators. Cramwell Research Institute, Adams 7, Mass.

U.S. Civil Service Tests! Training until appointed Men—Women, 18-55. Start high as $340.00 month. Experience often unnecessary. Get Free 36-page book showing jobs, salaries, requirements, sample tests, benefits. Write today. Franklin Institute, Dept. F-22, Rochester, New York.

OWN Collection agency office. Pays big. Free details. Franklin Credit, Roanoke 7, Virginia.

LEARN to be an Executive thru Thomas Method of correspondence instruction under expert supervision. Business men approved. 15 executive management courses to choose from. Write for Free book, "Opportunities in Business Management." Thomas Schools, Dept. D4, 1428—11th, Seattle, Washington.

FINISH High School at home, spare time. No classes. Diploma awarded. Write for Free catalog. Wayne School, Catalog HBA-65, 2527 Sheffield, Chicago 14.

USED mail order, do-it-yourself Correspondence Courses and Books sold or rented. Free Catalog. Wall, Box 141, Byars, Oklahoma.

AMAZING Slide Rule. Instructions. Wolfe-Wolfe, Danville, Illinois. Free Information.

FREE Trial—Complete language course for home study by Linguaphone. The World's Standard Conversational Method. At home, easily, quickly learn to speak French, Spanish, German, Italian, Japanese, Russian, Modern Greek—any of 34 languages. It's like living in another land. Send for Free Book and details of Free Trial. No obligation. Try, don't buy! Linguaphone Institute, T-54-047 Radio City, New York 20.

LEARN Practical Timestudy! Your best move to better pay! Associated Techniques, P.O. Box 235-A, Hollidaysburg, Pennsylvania.

PIANO Tuning pays. Learned easily at home. GI approved. 59th year. Free booklet. Niles Bryant School, Dept. S, 3731 Stockton, Sacramento 20, California.

MEMORY Education. Additional mental power. Lesson One of Memorology free. Memorology Studio, 2016-S Sunnyside, Chicago 25, Illinois.

MATHEMATICS. All levels. Correspondence. UCSM, 2406 W. Garfield, Milwaukee, Wisconsin.

BOOKS. Free 1957 catalog. 100 pages. Text, vocational, educational, instructional subjects. Millions of volumes, new and used. Bargain prices. Books bought. Est. 1902. Long's College Book Co., Dept. PS, Columbus 1, Ohio.

PIANO Tuning pays. Big money in spare time. Learn at home in 30 days. No musical knowledge necessary. Phonograph, records, tools and instructions furnished. Personal instructions available. Free catalog. Capital Tuning School, 16 Southwest Second, Fort Lauderdale, Florida.

COMFORTABLE living for life with simple arithmetic knowledge operating your own Independent Bookkeeping, Control Analysis Service. Free eye-opening details. Go after this desirable profitable business now. Vanderdrift, 35A Franklin Street, East Orange, New Jersey.

DRAFTING-Design, Architectural, Mechanical, Electrical, Structural, Aircraft, Mathematics, Physics, Estimating, Surveying. Veteran approved. Mondell Institute, 230 West 41 St., New York.

LEARN Mineralogy at home. Diploma course. Fortunes now being made in Uranium and other minerals. Free catalog. Mineral Science Institute, Desk 3, 150 East Ontario, Chicago 11.

"SECRETS Most People Don't Know". Amazing Details Free. Dr. Wayne Sutton, Benton, Kentucky.

TRANSFORM yourself via Subconscious Dynamics. Free Amazing Brochure. Box 847, (A-4), Ocean Park, California.

Learn Camera Repair. Easy, complete, approved home-study course. Free Illustrated Booklet. National Camera Repair School, Dept. D-4, Englewood, Colorado.

HELP yourself to abundant living. Our courses have aided students to richer, fuller lives. Learn secret of contentment, happiness. Earn degrees Ps.D, Ms.D. Write for free book. College of Universal Truth (Correspondence School), 23-K E. Jackson, Chicago.

MAKE Photo Statuettes For Fun And Profit. Illustrated Instructions $1.00. Marra, 1337 Kenilworth, Cleveland 7, Ohio.

PHYSICAL Therapy & Massage. We train you at home. Earn Big Profits From Your Own Private Practice or Work With Hospitals and Doctors. Free Catalogue. National Institute, Desk 3, 159 E., Ontario, Chicago 11.

$$$$ GROW Mushrooms. Cellar, shed. Spare, full time, year round. We pay $3.50 lb. We have over 25,000 customers. Free Book. Mushrooms, Dept. 180, 2954 Admiral Way, Seattle, Washington.

LEARN Appliance Service and Repair. Motors, Washers, Refrigeration, Cleaners, everything. Free Booklet. Armstrong, 11027-B South Vermont, Los Angeles 44.

46 CONTESTS

WIN contest money. General Contest Bulletin gives hundreds of tips. Lists current contests, rules. Sample magazine 25c. General Contests, 1609-A East 5th, Duluth, Minnesota.

PRIZE Contests provide Fabulous and Confidential Home Income Opportunity! Here's How and Where to Win Your Share! Send stamp! National Contest Bulletin, Box 2685-PS, Miami 16, Florida.

LEARN To Win Puzzle Contests. Instructions That give Knowhow. Puzzles That Develop Skill. Cash Prizes For Incentive. Unique Contests, Box 99, Mt. Vernon, Illinois.

47 DETECTIVES

DETECTIVES—Work home—Travel. Experience unnecessary. Detective Particulars free. Write Wagoner, P-125 West 86th, New York 24.

DETECTIVE Training. Phillips Secret Service System, 1917-C North Kenneth, Chicago 39, Ill.

FINGERPRINTING Taught At Home. Alabama School of Fingerprinting, Box 185, Fairfield, Alabama.

DETECTIVE Credentials—$2.00. Wholesale House of America, 210 Fifth Avenue, New York 10, New York.

48 LANGUAGE OUTFITS

65c EACH (plus 2c tax for Mich. residents only) will solve your language difficulties with the Cuthbertson Verb Wheel (available—German, Latin, Italian and Portuguese) send name and address and 65c to John M. Hanson, Dept. V., P.O. Box 418, Grand Rapids, Michigan.

50 BUSINESS SERVICE, INFORMATION, NAME LISTS

MAILING Lists most any classification $5.00 1000. Your circulars mailed with ours $4.00 1000. Write for our literature. Dixie Mailers, King, North Carolina.

1000 NAMES—New Mothers $6.00. Harbor, Box 453, Quaker Hill, Connecticut.

3000 MAIL Buyers $3.00. Other categories. Free literature. George Lucas, Bellevue, Washington.

"NAMES Won't sell your products unless they're active." 1957 Guaranteed active mail order buyers list—$8.00 1,000. On gummed labels $12.00. N.Y. Sales, 137 Corbin Place, Brooklyn 35, New York.

NAME Lists! Classifications Unlimited! Inquiries invited. Mailtrader, Box 643-L, Ann Arbor, Michigan.

52 AUTHORS SERVICE

WANT Your Book Published? Learn how we publish, advertise, promote, distribute. Many successes. Free booklet PS. Vantage, 120 West 31, New York.

POPULAR SCIENCE OPPORTUNITIES

WRITERS: Book Manuscripts invited for publication on our cooperative plan. Greenwich Book Publishers, (Atten. Mr. Ibsen), 489 Fifth Avenue, New York 17, New York.

53 ADVERTISING, AGENCIES, ETC., FOR ADVERTISERS

FREE expert assistance for mailorder advertisers. Ratebook leading newspapers, magazines, 10c. Chicago Advertising Agency, Chicago 4.

ADVERTISE: 24 words, 100 Canadian Newspapers, $5.50. Lists Free. Advertising Bureau, 10511-P Springfield, Chicago 43.

54 CARTOONING, SIGN PAINTING, CHALK TALKS

LETTER patterns — reflective letters. Catalogue dime. Patterns, 2240/PS Fillmore, Chicago 12.

"HOW To Make Money With Simple Cartoons"—A book everyone who likes to draw should have. It is free; no obligation. Simply address: Cartoonists' Exchange, Dept. 194, Pleasant Hill, Ohio.

LEARN Sign Painting at Home. Free Talent Test. Ben Kerns, Box 812-S, Greenville, South Carolina.

EARN While Learning. Straley Signs, 410 So. Western, Springfield, Ohio.

MAKE Reflectolite Signs To Order. Starting Kit $1.00. Edward Cook, Martin Avenue, Saratoga Springs, New York.

WONDERFUL Courses, Painting, Signs, Cartooning, Drawing. Back dated Art Magazines. Eight $1.00. Free literature. Art Book Shop, Arnold, Missouri.

YOU can Entertain with Chalk Talks. Catalog 10c. Cartoonist Balda, Oshkosh, Wisconsin.

CARTOONIST: Amateur, Professional. Prepare for animation with Max Fleischer's plan. Write Vera Coleman, 60 East 42nd Street, New York, N. Y.

PAINT Signs—Master die cut, outline letter patterns. Complete assortment, 1½" to 12" high, prepaid $2.00. Everly, P-583, Newton, Iowa.

55 TYPEWRITERS & OFFICE MACHINES

TYPEWRITERS Bargains! All Makes. List free. Woods Typewriters, Bedford, Pennsylvania.

TYPEWRITER Office Printing Machines. Bargains, Reconditioned, Rebuilt, $25.00 Up. Write DixieGraph, King, North Carolina.

REMINGTON Typewriters, Adding Machines, New. Nothing Down, Dollar Week Payments After 30 days, Free Delivery. Write For Application. Cashine, Forsyth, Carnegie, Pennsylvania.

56 RUBBER STAMPS & OFFICE SUPPLIES

3 LINES $1.00. 4 or 5 Lines $1.50. Any wording. Script $2.50. Roughsedge's, 2 Lionel, Clark, New Jersey.

NEAT Balanced Lines, 3 for $1.00. Evero, Box 5377, Phoenix, Arizona.

QUALITY Rubber Stamps 3 lines $1.00. 1 day service. Youngers Stamp Shop, Princeton, Iowa.

THREE Line Cushion Mounted Indexed Stamp-Dollar Twenty-Five. Tesco Industries, 1805 Piedmont, Jackson 2, Mississippi.

THREE line name and Address. Metal or plastic pocket Case $1.00. Mated Mailers, Post Office Box 494, Buffalo 5, New York.

3 LINES $1.00. Cushioned—Indexed. Satisfaction Guaranteed! Camfield, 14 Beaufort Circle, Springfield 4, Massachusetts.

ATTRACTIVE Name and Address Stamp. $1.00. V. Manley, 4124 Rhawn St., Philadelphia 36, Pennsylvania.

FOR $1.25 Your Name, Address in letters ⅛" High. In Three Lines, Prepaid. Cash, Check, Money Order To: Robert Hanner, 1025 No. 51 St., Lincoln 4, Nebraska.

3 LINES And Pad $1.00. Jones, 230 W. 10th, Tarentum, Pennsylvania.

57 PRINTING MULTIGRAPHING, ETC.

TOP quality printing, mimeographing. Free literature. Currier, PSM, New Lebanon Center, New York.

ECONOMICAL printing of books, catalogs, publications. Catalog free. Adams Printery, 30 West Washington, Chicago 2, Illinois.

BUSINESS Printing, Samples, Prices Free. Howprint, 723-W Eunice, Webster Groves 19, Missouri.

100 BUSINESS Cards $1.00. Print Shop, 1418 Broadway, Rockford, Illinois.

OFFSET, "Copy Preparation" folio, samples 25c, Refundable. Litho, Madison, Tennessee.

FREE Printing Price List. John Peper, Box 822, Chattanooga 1, Tennessee.

OFFSET printing $6.50—1000, 8½X11, 16 lb. National Letters, 251 W. 42nd St., New York 36.

500 ¾x2½ FOUR line gummed stickers 50c. Red Border $1.00. Moritz Printer, Saginaw, Michigan.

1,000 "RAISED Letters" Business Cards $3.50. Samples. Pioneer, Island Park 14, New York.

250 LETTERHEADS (8½x11)—Envelopes (6¾) Both $4.65—25c postage. Starlight, 170-05 Baisley Boulevard, Jamaica 34, New York.

FREE! America's first Discount Printing catalog! Try us on 1,000 better-looking business cards, free case included, $3.49 postpaid. No COD's. Discount Printing Center, 1116-B National Press Building, Washington 4, D.C.

FREE! — Printing Samples (Business Cards—$2.95 Thousand) Wayside, Livermore, California.

58 PRINTING OUTFITS, SUPPLIES

DO your own printing. Save money. Simple rules. We supply everything. Print for others; good profit. Raised printing like engraving too. Have home shop. Details free. Kelsey Presses, V-8, Meriden, Conn.

PRINTING Presses. Type Supplies. Lists 3c. Turnbaugh Service, Mechanicsburg, Pa.

RUBBER Stamp making presses, hydraulic operated, electrically heated. Sizes 5"x8", 8"x12", 10"x15" starting outfits. All kinds supplies. Custom Manufacturing, 601 N. Jefferson, Springfield 2, Missouri.

MAKE your own self-molding rubber stamps and printing cuts. Plexirubber, Argyle 2, Wisconsin.

59 PATENT ATTORNEYS

C. A. Snow & Co.—S-427, Snow Building, Washington 1, D. C. Registered Patent Attorneys. Write for information.

INVENTORS—Send today for instructive booklet "Patent Protection for Inventors" giving detailed patent information and outlining preliminary steps to take toward patent protection—also "Evidence of Invention" form. Victor J. Evans & Co., 341-D Merlin Building, Washington 6, D. C.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent. John Randolph, Registered Patent Attorney, 207 Columbian Bldg., Washington 1, D. C.

INVENTORS: Learn how to protect your invention. Unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and prepared to serve you in handling your patent matters. "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure with "Record of Invention" form will be forwarded to you upon request—without obligation. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 72B-D District National Building, Washington, D. C.

INVENTION Record form free and "Patent Information Every Inventor Should Have." Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

PATENTS—Irving L. McCathran, 316 McLachlen Bldg., Washington 1, D. C. Registered Patent Attorney.

INVENTORS—If you believe you have an invention you should find out how to protect it. The firm of McMorrow, Berman & Davidson with offices in Washington, D. C., is qualified to take the necessary steps for you. Send for copy of our Patent Booklet "How to Protect Your Invention." We will also send you an "Invention Record" form. No obligation. They are yours for the asking. McMorrow, Berman & Davidson, Registered Patent Attorneys, 143-K Victor Building, Washington 1, D. C.

"INVENTOR'S Guide" and "Record of Invention" free on request. Frank B. Ledermann, 154 Nassau Street, New York City.

INVENTORS: When you are satisfied that you have invented something of value write me, without obligation, for information as to what steps you should take to secure a Patent. Write Patrick D. Beavers, Registered Patent Atty., 938 Columbian Bldg., Washington 1, D. C.

60 FOR INVENTORS

INVENTORS, If you have an invention for sale, patented or unpatented, write Institute of American Inventors, Dept. 30A, 635-F St., N.W., Washington 4, D. C.

INVENTORS: Learn how to protect your invention. Unless the inventor is familiar with patent matters, he should engage a competent registered patent attorney or agent to represent him. We are registered to practice before the U. S. Patent Office and prepared to serve you in handling your patent matters. "Patent Guide for the Inventor" containing detailed information concerning patent protection and procedure with "Record of Invention" form will be forwarded to you upon request—without obligation. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 72A-D District National Building, Washington, D. C.

INVENTORS—Send for free patent information book and inventor's record. Registered Patent Attorney, Associate Examiner, Patent Office 1922-1929; Patent Attorney & Advisor, Navy Department 1930-1947. Gustave Miller, 47PSI Warner Building, Washington 4, D. C.

INVENTORS—This firm is registered to practice before the United States Patent Office and available to assist you in the preparation and prosecution of your patent application. "Patent Protection for Inventors" booklet containing detailed information and steps to take toward patent protection sent promptly upon request. No obligation. Victor J. Evans & Co., 342-D Merlin Building, Washington 6, D. C.

INVENTION Record form free and "Patent Information Every Inventor Should Have." Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent on your invention. John Randolph, Registered Patent Attorney, 206 Columbian Bldg., Washington 1, D. C.

INVENTORS Don't sell your invention Patented or Unpatented until you receive our offer, write Cowgill, Box 298, Marion, O.

YOUR Invention Manufactured In Our Large Factory And Distributed Through Our Nation-Wide Organization. Royalty Or Otherwise. Mitchell, P.O. Box 771, Des Moines, Iowa.

INVENTORS—If you believe you have an invention, we can make a preliminary search on your invention and advise you whether we think it can be patented. Send for copy of our Patent Booklet "How to Protect Your Invention" and "Invention Record" form. No obligation. McMorrow, Berman & Davidson, Registered Patent Attorneys, 143-L Victor Building, Washington 1, D. C.

PATENT searches. Information and free forms on request. Evelyn B. Surles, P.O. Box 75, Washington 4, D.C.

PATENT Searches including copies of nearest patents, $6.00. Reports airmailed within 48 hours. More than 100 registered patent attorneys use my service. For Free invention protection forms, write Miss Ann Hastings, P.O. Box 176, Washington 4, D. C.

PATENT Searches $5.00. 48-hour airmail service. Invention Protection forms free. Write Patent Engineering Service, 711 14th Street, N.W., Washington 5, D.C.

POPULAR SCIENCE OPPORTUNITIES

PATENT Searches $5.00. 48-hour service. Free Invention Protection forms. Write Raymond L. Smith, Patent Searcher, 620 Sheraton Building, Washington 5, D. C.

"INVENTOR'S Guide" and "Record of Invention" free on request. Frank B. Ledermann, 154 Nassau Street, New York 38, New York.

IDEA And Product Evaluation By Professional Engineers. Ran-Wen Engineering Company, Box 162, Morris Plains, New Jersey.

SEARCHES—Put your patent searches in the hands of a Registered Patent Attorney or Agent as he qualifies to give a worthwhile patentability report. Record of invention form upon request and information on patent protection. Patrick D. Beavers, Registered Patent Attorney, 939 Columbian Bldg., Washington 1, D. C.

61 INVENTIONS WANTED

INVENTIONS wanted. Patented; unpatented. Tremendous Manufacturers lists. Global Marketing Service, 2420 77th, Oakland 5, Calif.

INVENTORS: Hundreds of manufacturers have requested our assistance in locating marketable new products. Complete information free. Institute of American Inventors, Dept. 30C, 635-F Street, N. W., Washington 4, D. C.

INVENTORS Don't sell your invention Patented or Unpatented until you receive our offer, write Cowgill, Box 298, Marion, O.

INVENTIONS Wanted. Patented or Patent Pending. 26 years experience Promoting Inventions. National Service Bureau, 3122 Meramec, St. Louis 18, Mo.

INVENTORS: If you have an invention for sale, patented or unpatented, write for free brochure outlining manufacturers' requirements, royalty rates. Kessler Corporation, 741W, Fremont, Ohio.

INVENTIONS Wanted by manufacturers. Will promote patent pending or patent only. Free Television publicity if accepted. Inventors Creative Service, 354 South Spring Street, Los Angeles 13, California.

INVENTORS—Give us the opportunity to explain our selling plan for your invention, gadget or device, patented or unpatented; free particulars available upon request. Demarest And Demarest, Box 95, Battle Creek, Michigan.

ORGANIZATION active various countries South America, particularly Argentina, Brazil, Venezuela, Chile, Uruguay, offers development patents originating United States. Complete references. Write PS-926, 125 W. 41 St., New York.

INVENTIONS wanted now by my Manufacturer-Clients. Patented. Unpatented. Write Adams, Patent Broker, 80-K Wall Street, Financial District, New York City.

CASH Buyers for inventions. Write National Inventors Institute, Box 7007, Cleveland 28, Ohio.

SUPERIOR promotions. Patented, unpatented inventions. Informative booklet, free. Superior, 338-342 North Rodeo, Beverly Hills, California.

INVENTORS. Free Book. "Selling Your Invention." Inventors Exchange-A, Hartford 1, Connecticut.

INVENTORS: Reliable marketing service can sell your invention. Opportunities Unlimited, Stillerman, 7719 Phillips, Chicago 49, Illinois.

62 PATENTS FOR SALE

PAT. 562-101 Zipper retaining attachment—ingenious, universally practical, necessary. Negotiate.

64 MODELS, MODEL SUPPLIES

SHIP and yacht model fittings; blueprints. Send 35c for Illustrated catalog #29 listing hundreds of items. A. J. Fisher, 1002-2 Etowah Ave., Royal Oak, Michigan.

SHIP Models. Most complete line in New England. Kits, fittings, plans, books, tools, engines, motors. Illustrated catalog 30c. James Bliss and Co., Inc., Dept. PS, 342 Atlantic Avenue, Boston 10, Mass.

POWER Models. Unusual steam, gasoline and traction engines, fittings, metals. Comprehensive catalog $1.00. Charles Cole, Ventura, California.

SHIP Model kits and numerous fittings from authentic plans including clippers, trawler, fishermen, frigates, privateer, radio control tug, etc. Send 25c for our new 1957 catalog. Model Shipways, Folio P, 39 West Fort Lee Road, Bogota, N. J.

LIONEL Trains. Big Discounts. Bulletin Free. Catalog 25c. Mack Brothers, 2041 Chicago Ave., Chicago 22.

JUMBO Modelcraft Catalogs: Airplanes, Boats, Cars—25c, Railroad—25c. 10,000 items. Bargains List Free. America's Hobby Center, 146L West 22nd Street, New York 11, New York.

65 HOME CRAFTSMAN

ALL Crafts, Supplies. Large Free Catalog. National Handicraft, 199 William St., New York 38.

WOODWORKING and Cabinetmaking course for beginning and advanced home craftsmen. Only complete low-cost home training program available. Write for free booklet. Interstate Training Service, Dept. G-2, Portland 13, Oregon.

FREE Complete Illustrated catalog. Leathercraft kits, supplies. J. C. Larson Co., 820 S. Tripp, Dept. 6926-LA, Chicago 24.

LEARN Art Metalcraft and jewelry making. Complete, inexpensive, home training course now available. Special tools and materials furnished. Write for free booklet. Interstate Training Service, Dept. L-2, Portland 13, Oregon.

LEATHERCRAFT, Copper Enameling, Mosaic Tile, Shellcraft, Metal Tooling, Beadcraft. Many more Crafts. Free Big Catalog. Kit Kraft, Dept. 324, Studio City 1, California.

FREE "Do-It-Yourself" Leathercraft Catalog. Tandy Leather Company, Box 791-N19, Fort Worth, Texas.

JIGSAW Patterns 102 $1. Full size. Plus Alphabets. Barebo, O'Fallon, Missouri.

GRANDFATHER Clock Movements, Dials, Plans, Kits. Wholesale catalog 25c. Mason-Sullivan, Noroton 2, Connecticut.

FREE. New catalog, 1,668 Patterns, Designs, Craftplans. 1321-B Michigan, Chicago 5.

DO-It-Yourself! Aluminum Extrusion assortment only $1.00. Sun-Storm, P.O. Box 2088, Hollywood, Florida.

STYLECRAFT sure fire hits. "Pretraced" leather kits. Handbags, Billfolds, Filigree Belts, over fifty other projects. Patterns on leather. Why trace? Just carve, assemble and lace. Large assortment "precarved" kits also available. Send 25c for catalog, free folder. Refunded first order. Apache Leather Company, 2804 E. Washington St., Phoenix, Arizona.

KNOCKDOWN cedar chest and lumber free price list. Bedford Lumber Company, Shelbyville, Tennessee.

SQUAREKNOTTERS: Make belts, handbags, lanyards, dog leashes, etc. Special offer! Beginner's book, catalog and quality cord samples 25c. P. C. Herwig Co., Dept. 71-P7, 39 Henry St., Brooklyn 1, New York.

BUILD-it-yourself kits, gun racks, cabinets, modern shelves, etc., free list. Lee, 719 Moore Street, Bristol, Virginia.

65A WOOD PRESERVATIVES

FREE Wood Preserving Guide. What and where to use for home and yard. Rot Stoppers, 976 Ellicott, Buffalo 9, New York.

66 BUILD IT YOURSELF

BUILD your own optical instrument! New book—"Fun With Optics" tells you how! 32 exciting pages. Full diagrammed instructions on how to build telephoto lenses, telescopes, microscopes, slide viewers, artist drawing projectors, binoculars, magnifiers, riflescopes, etc. We can furnish the lenses, prisms and parts you'll need. To get this terrific book send your name and address and only 50c, full price—request Stock No. 9050-CX. Edmund Scientific Company, Barrington, New Jersey.

MELT Cast Iron, Brass, Aluminum. Make castings for profit. Free literature. Ursutz Burner Company, Box 566-S, Tempe, Arizona.

BUILD Your Own Reinforced Concrete Or Block Swimming Pool 16'X32'X8' For $600.00. Filter, Diving Board, Skimmer, $1.00 Brings Complete Details. Box 1201, Ogden, Utah.

BUILD Streamlined plywood kitchen cabinets. Plans, photos, instructions, $1.00. Playnecabinets, 4617 Johnson, Western Springs, Illinois.

MOWER Kits and Parts. Also complete Mowers. Write for free plans and Literature. Triangle Mfg. Co., Box 185, Ft. Scott, Kansas.

BARBECUE pit. No grease fire! Plans $1.00. Department B, Box 53, Detroit 31, Michigan.

AWNING prices fractured! You install! Aluminum, roll-up. Free literature. Fifth Avenue Awnings, 210 Fifth Avenue, New York 10-D.

NEW Amazing Portable Sprinkler System, Make-It-Yourself in One Hour for 10c Linear Ft., Absolute Water Control—Saves Time, Saves Money. Guaranteed. Plans $1.00, Frix, Dept. PS, Box 864, San Jose, California.

67 OLD GOLD, JEWELRY, WATCHES, ETC.

COSTUME Jewelry supplies. Catalog and samples. 35c. Largest line in America. Milady-Fair Co., G.P.O. Box 1328, New York City 1.

HIGHEST Cash For Old Gold, Broken Jewelry, Gold Teeth, Watches, Diamonds, Silverware, Spectacles, Platinum, Mercury, Gold Coins. Free information. Rose Refiners, Heyworth Bldg., Chicago 2.

PREFERRED source for quality settings and stones. Manufacture costume jewelry at home. Extensive catalog 25c. A. V. Cutt Co., 210-T Fifth Ave., New York 10, N.Y.

USED and new watches $2 up. Free List. Southern Watches, Gray 2, Georgia.

CASH for Old Gold, Broken Jewelry, Gold Teeth, Rings, watches, Platinum, etc. Eastern Refiners, 102 Pine St., Bristol, Connecticut.

COPPER Enameling Supplies, Rhinestones, Pearls, Jewelry Settings. Catalog 10c. J&M Novelties, Dept. CD-4, Griffith, Indiana.

CUCKOO Clock, Germany to you with valuable stamps, $6.95. Allied, 166B Catherine, Red Bank, New Jersey.

CASH for gold, broken jewelry, gold teeth, silver, platinum, mercury, watches, rings. Sagee, Mt. Carmel, Pennsylvania.

10 SWISS watches $18.00. Catalog 20c. Berkowitz, 1150 Castlehill, New York 62.

69 FOR THE HOME

FOAM rubber furniture cushions—Factory seconds 50% discount. Free catalog. Perma-Foam, 236-A Rhode Island Ave., East Orange, New Jersey.

BEAUTIFUL Hand Painted Pictures. Mountain scenes, Snow scenes, Figures. 18" x 15"—$3.00. Two For $5.00. 18" x 45"—$6.00. Two For $11.00. Art, Box 272, Wilson, North Carolina.

SEPTIC Tanks cleaned without pumping. Full instructions One Dollar. Nebus, Box 333, West Palm Beach, Florida.

REFLECTORIZED mailbox markers, personalized doormats, pet products, unusual gifts. Evelyn's, Central Valley, New York.

70 OF INTEREST TO WOMEN

RAISE Money! Making, selling Artificial Flowers, Corsages, Novelties. Big illustrated catalog 25c (refundable). Profitkrafts, 4513-D22 Lorain, Cleveland 2, Ohio.

MAKE Money Addressing Envelopes. Our instructions reveal how. Glenway, Box 6568, Cleveland 1, Ohio.

DOLLARS by mail. Report "4% Insured Savings," $1.00. Day Reports, Box 4-B, Evanston, Illinois.

EASY home addressing-mailing work. All-profit. Experience unnecessary. Mann, Woodcliff Lake, N.J.

GOOD Money In Weaving. Weave rugs at home for neighbors on $89.50 Union Loom. Thousands doing it. Booklet free. Caricraft Co., Power Street, Boonville, New York.

GRAY Faded Hair Corrected $2.00. Three for $5.00. Harold Mishrell, 1745 High Street, Erie, Pennsylvania.

60% PROFIT Cosmetics $25 day up. Hire others. Samples, details. Studio Girl-Hollywood, Glendale, California. Dept. 1174H.

CLEAN all your rags, upholstery for 75c. Formula 50c. Stern, Box 1191, San Bernardino, California.

POPULAR SCIENCE OPPORTUNITIES

$200.00 MONTHLY Possible. Sewing babywear! No house selling! Send stamped, addressed envelope. Babygay, Warsaw 14, Indiana.

DAB-it—sensational new solid perfume. $1.00 per compact. Dean Heck, Box 199, Bloomington, Illinois.

SUN Bonnets, washable prints. $2.00. Rosecraft Bonnets, 1A, Brookhaven, Mississippi.

$$$$ GROW Mushrooms. Cellar, shed. Spare, full time, year round. We pay $3.50 lb. We have over 25,000 customers. Free Book. Mushrooms, Dept. 181, 2954 Admiral Way, Seattle, Washington.

71 FOR SALE MISCELLANEOUS

ELECTRIC Sewing Machines $22.50. Buttonholers, $6.25. Free Circular. Summer's, 2653 Bellevue Avenue, Cincinnati 19, Ohio.

HAWAIIAN hula skirts, 22" waist, $2.15, 24", $2.25, 31", $3.00. 8" Outrigger Canoe U-build Kit, $2.75. Watercolour flower paintings, Orchids, Torch Ginger, Anthuriums, 14"x19", $9. Eshelby's, 1060 Spencer, Honolulu.

FREE Hawaiian Gift List. Exotic Perfumes, Hula Girl tie, Scarfs, etc. Stamp Appreciated. Act Now! Write: Fobel, 3132-G George Street, Honolulu.

72 WANTED TO BUY

SCRAP Mercury (Quicksilver) containers supplied—Tantalum, Tungsten, Silver, Platinum. Metallurgical Products Company, Established 1909, 35th & Moore Sts., Phila. 45, Pennsylvania.

QUICKSILVER, Sterling, Silver Solders, precious metals. Mercury Terminal, Norwood, Massachusetts.

74 RAZOR BLADES, SHAVERS

100 QUALITY blades, double edge—$1.00. Guaranteed. Free samples. Kalnmais, 1934 N. Hoyne, Chicago 47, Illinois.

75 TATTOOING SUPPLIES

TATTOOING Outfits, licensed course. Brochures 25c. Zeis, 728 Leslie, Rockford, Illinois.

77 GEIGER COUNTERS & TREASURE FINDERS

FIND Buried Treasure, gold and silver, with Goldak's sensational 3½ lb. "Find-It" locator, only $49.50. Write for free literature on commle's line of mineral, metal locators; Geiger and scintillation counters. Goldak, 1540 W. Glenoaks Blvd., Glendale, California.

FIND lost or hidden treasure with new, improved metal detector. Works around salt water. No ground pick-up. Free literature. Gardiner Electronics, Dept. 1, 2545 E. Indian School, Phoenix, Arizona.

LITHIUM — The wonder metal. Free booklet describes prospecting information, uses, etc. Nu-Age, Box 142, North Battleford, Sask., Canada.

FREE—16-page Manual from world's largest mfr. of Prospecting Equipment. Detectron Corp., 5528 Vineland, North Hollywood, California.

TREASURE Metal-Mineral Detectors, M-Scope. Used worldwide for Treasure Hunting. Mineralights, Geiger, Scintillation Counters. Prices from $14.75. Fully guaranteed. Use our Time Payment Plan. Free booklets on Treasure Hunting, Uranium Prospecting. Free catalog. Fisher Research Lab., Inc., Dept. C-2, Palo Alto, Calif.

COMPLETE line Treasure Finders, Geiger Counters. Latest Underwater detector. Free Catalog. Sierra Scientific, PS14, 5415 York, Los Angeles 42, California.

FORTUNES for the taking. Gold, Silver treasures. Light weight, guaranteed, power-packed Metal Detectors. Kits and Assembled models from $39.90. Geiger Counters and Mineralights. Free Literature. Electronic Applications, Dept. S, Box 8, Arlington 10, Virginia.

FIND Uranium, Valuable Metals & Minerals. Buried Treasures! One of the world's oldest and most reputable suppliers offers a complete line of equipment—Geiger Counters, Assay and Test Kits, Metal Detectors, etc. Instruments traded and repaired. Write for Free Literature on Profitable Prospecting. The Radiac Co., Inc., 489 Fifth Ave., Dept. P-4, New York 17, New York.

78 WATCH REPAIRING

WATCH and clock repairing books. Free catalog. North American, 2320-BD Milwaukee, Chicago 47, Illinois.

WATCHMAKERS' — Jewelers' — Machinists' Tools. Watchmaking Course. Catalog 25c. Bengal, Culver City, Calif.

WATCHMAKERS' Tools, Materials, Supplies, Watches. Catalog. Gales, Box 1000, Chicago 90, Illinois.

79 MISCELLANEOUS

FREE Wholesale Catalogs! Sporting Equipment — Cameras — Homewares — Everything. Econ-O-Mart, Whippany 6, New Jersey.

ADULT, Worldwide Big Mail—10c. Jack Goldstein, 1420 Clay, Bronx 56S, New York.

RECEIVE—Magazine Samples, Mails, Catalogues, Offers From Everywhere. Get Listed 25c. Rorick's, Cincinnati 26, Ohio.

BUY Wholesale! Discounts to 80%! Appliances, Cameras, Sporting Goods, Housewares, Watches, Tools, Clothing, etc. Buy-Rite, Hawthorne 6, New Jersey.

LUCKY Charm $3.00, brings luck, success, fulfills desires. S. B. Wazkar, 31, Khattarguily, Bombay, 4.

CESSPOOLS, etc. cleaned without pumping. Details. Chemical Cesspool Cleaning Co., Allston 34, Mass.

BIG mails 10c, Giant Mails 25c. Greener, B509-S, Burley, Idaho.

GERMAN address lists anything manufactured 25c. Burke Associates, Manchester 2, Massachusetts.

BIG Money raising fishworms and crickets. Free Information. Carter Farm-12, Plains, Georgia.

"WINEMAKING," $1.00. "How to Make Beer—Ale," $1.00. Illustrated. Eaton Publications, Box 1242-U, Santa Rosa, California.

SAMPLES, magazines, catalogs, opportunities. Year, 25c. Star Mailers, Leming, Texas.

BIG Mails, four months listing, 25c. Wright Publications, 2276 Hubbard, Memphis 8, Tennessee.

CIGARETTES—Roll 20 for 9c. Facts free. Moberly, Box 811, Owensboro, Kentucky.

MAKE 20%-50% on savings etc. easily with safe plan $2.00 (Refundable). Details free. Factor, 676 West Center, Provo, Utah.

GOLD Panning. Useful Information On Placer Mining, Recovery Methods Etc. Tells How. Send $1.00. Globe Enterprises, Box 592, Globe, Arizona.

BOOKS on antiques and their prices. Free circular. Warman Publishers, Uniontown, Penna.

HAIR Clipper Attachment Barba Skill makes home hair cuts easy and look like a professional job. Steel construction with super dylon plastic comb. Guaranteed to fit all models. If not satisfied your money back. Only $3.00 Postpaid. Hutchens Industries, Inc., Box 20, Eau Claire, Wisconsin.

GROWING Up Silver Gift For Baby! Three spoons, two forks, knife. Rush $4.95 to Paul Grabill, Grabill, Indiana.

$$$$ GROW Mushrooms. Cellar, shed. Spare, full time, year round. We pay $3.50 lb. We have over 25,000 customers. Free Book. Mushrooms, Dept. 182, 2954 Admiral Way, Seattle, Washington.

79A SURVEYING INSTRUMENTS

NEW And Guaranteed Factory rebuilt transits and levels, sale or rent, with purchase option. We will repair, trade or buy old instruments. Write for list PS-74. Warren-Knight Co. (Manufacturers of Surveying Instruments), 136 N. 12th St., Philadelphia 7, Pennsylvania.

80 PERSONAL

MEXICAN Legal Matters. A. Espejo, Box 217, Tijuana, Mexico.

LATEST Methods treating piles, fistula, Colon-Stomach disorders. Write for free book. McCleary Clinic and Hospital, E744 Elms Blvd., Excelsior Springs, Mo.

PSORIASIS Sufferers: Discouraged? Write for Free important information today! Pixacol Co., Box 3583-SP, Cleveland 18, Ohio.

LEARN While Asleep! Details Free. Research Association, Box 610-K, Omaha.

REMAILS 20c. Literature Free. Persil, 436 New York Avenue, Brooklyn 25, New York.

BIBLE reveals Time of End! Exact Year, Month, Day sent free! Write: Harvest, Jefferson City 2, Missouri.

LETTERS Remailed 25c Each, 6 for $1.00. Permanent Mailing address. J. Love, 1419 E. 83rd, Los Angeles 1, California.

BUDGET your expenses. Let me show you how to set up your own personal budget system. It has worked for me for 20 years. Send $1.00 to W. T. Adams, RR2, Angola, Indiana.

REMAILING Letters 25c, 6 for $1.00. H. L. Costigan, 261 Bement Avenue, Staten Island 10, N.Y.C.

THERE'S a trick to tying bow ties so they always stay neat and horizontal—not cockeyed. $1.00 brings artists drawings through the mirror. Detailed instructions. Satisfaction guaranteed. National Ties, 248 N. Park, Decatur, Illinois.

PHILADELPHIA—Remails 25c—Classified $1.00. Steven, 539 Arthur Street, Philadelphia, Pa.

PRESS Card $1.00. Wholesale House Of America, 219 Fifth Avenue, New York 10, New York.

MONEY worries? Copyrighted plan free. Driftelmar Industries, Box 506, Miami, Florida.

SECRETS Handwriting reveals, amazing book $1.00. The Analyst, 211 E. Mulvane, Mulvane, Kansas.

REMAILING, Receiving, Confidential World Service 20c Each. S. Flanders, 38 South Dearborn, Chicago 3, Illinois.

BUNION Pains Relieved With Longlasting Adjustable Bunion Pad. Protects Painful Bunion From Shoe. Specify Right or Left, Men or Women. $1.00 Each. Detroff, 46 Williams Street, Brookline 46, Massachusetts.

MAKE your own will! Legally drawn copyrighted form. $1.00. Conlon, Box 288, Bartlesville, Oklahoma.

FREE Vitamin Catalogue—Quality capsules for better, healthier living. Feel younger—more vigorous. Buy direct—Save! Vitamin-Center, Drawer 2318E, Detroit 31.

SECRET Mail Receiving Forwarding System. $3 Month. Hedgpeth, Box 830, Alhambra 24, California.

MEXICAN Law, General Practice. Lic. Ceniceros, Apartado 79, C. Juárez, Chih., México.

DRUG Sundries Wholesale, Men, Women. Illustrated list 25c coin. P. P. Ally, 1123 Ellicott, Buffalo 9, New York.

SUPER Memory Overnight! Success guaranteed! Bijou, Box 1727-V6, Hollywood 28, California.

HOLLYWOOD, Miami, Honolulu, Houston, 6 Postcards $1—Remailed free—Receiving Forwarding $3 month—Classifieds $1. Rafeal, 1813-PS Martha, Pasadena, Texas.

"RULE others with thoughts." (Telepathy.) Details—stamp. Wisdom, 846 Sunnyside, Chicago 40.

"HOW Can I Find Out?" You Can! Information confidentially developed. Any matter, person, problem. World-wide Officially licensed. Established 1922. William Herman, 170 Broadway, New York.

SOUTHERN California—Unlimited Opportunity and Jobs. Classified Ads and Questions Answered. $1.00. Walt Flood, 1037 3rd St., Santa Monica, California.

PROFESSIONAL charcoal portrait! Guaranteed! Send photo. $7.00. Patricia Fiske, 615 Crestland Dr., Austin, Texas.

HONOLULU Remailing 25c. Receiving—Forwarding available! Write: Fobel, 3132-R George Street, Honolulu.

WESTERN opportunities, big Sunday classified airmailed $1.00; letters remailed 25c. Peak's Antiques, 982 South Emerson, Denver 9, Colorado.

REMAIL by pony express, 25 cents. Kirby, Memorial Pony Express, 1657 Pennsylvania, Denver, Colorado.

BANISH age lines. Mystic secrets keep face youthful. $2.00. Men, Women. Erneida Gardiner, 330 East 257 Street, Euclid 32, Ohio.

THE 1957 **Sea Scamp**

ONE OF 22 NEW STARCRAFT MODELS

TAKE IT ANYWHERE!

Beam	Bow Depth	Transom Width	Motors	Keels
52"	23"	44"	1-10 h.p.	3

- **WEIGHS ONLY 99 POUNDS**
- **12 FEET OF FUN**
- **GUARANTEED ALUMINUM CONSTRUCTION**

Round bottom. No upkeep, no get-ready . . . built from heavy duty, lightweight aluminum. Non-skid floor walk. Choice of wood or aluminum seats. Reinforced stern. Large safety floats built in. Carries 15-year guarantee. No bottom seams.

WRITE TODAY FOR FREE **STARCRAFT** CATALOG

STARCRAFT BOAT COMPANY
Dept. N-4 • Goshen, Ind.

66,000 CANDLEPOWER

World's most amazing flashlight! Unique engineering creates 25 cell power from only 6 ordinary batteries that last twice as long too! Giant in size, over 17" long.

Called Hi-Bred BEACON
Has camera type optic reflector. Thrusts bullseye unbelievable distance. Ideal for home, boat, hunting, fishing or camping.

20 Mile Range
Easily signals 20 miles and will show up landmarks farther than you can see with field glasses! Life saving disaster light.

Sealed Beam
Uses factory sealed beam bulb filled with argon gas. Never gets out of adjustment.

New Hood Ray Shield
Prevents back-lash rays. Shields lens. More power. Biggest head ever put on a flashlight. **Exclusive Custom Model**

May Save Your Life
From your bedside spot prowlers hiding in dark yard. In event of attack would be your only light source to safety.

New Hi-Voltage
20% more volts than other flashlights.

$4.99
2 for $9.50
Deluxe—$5.99
2 for $11.50
add 35c ea. postage
spec. bulbs 5 for $1.
best batteries 6 for $1.50
Extra reflector $1.49
Deluxe shoulder sling $1.39

ELTO CO. Dept. 43-D 18442 Grand River, Detroit 23, Mich.

UNMATCHED SPEED FOR OUTBOARDS

Of all makes of 7½ HP and up on racing boats and fast runabouts is provided with the famous Michigan AQUA-JET propellers. No re-building of lower unit necessary. Each wheel specifically engineered for motor on which it is to be used. Other propellers for superior water skiing, cruising, general operation. Also complete line of skis, speedometers, boat accessories, described in our 1957 catalog. Send postcard for FREE copy. Michigan Wheel Co., Dept. PS-4, Grand Rapids 3, Mich.

ARBO-GASTER

DEADLY NEW DEEP-DIVING Fish Catcher

New deep-diving, floating lure. Amazingly weedless, rolls over deep-water snags. Perfect control, casting or trolling. Won't twist line. Choice 5/8 oz. and 1/4 oz. sizes in flashy new Reflector Finishes and Standard Colors. Write today for

FREE! BIG NEW COLOR CATALOG

FRED ARBOGAST COMPANY, INC.
2314 W. North St.
Akron 3, Ohio

BEST DEAL FOR THE MAN AT THE WHEEL

HULL AUTO COMPASS

While passengers enjoy scenery, the driver has to watch directions — unless he has a Hull to show the way, constantly, accurately. Driving is a pleasure with Hull, world's most widely used auto compass. $4.95 and $6.50. At your dealer's or write for literature.

A Favorite Boating Accessory, too!

HULL MANUFACTURING CO., P. O. BOX 246 E4, WARREN, O.

JEEP OWNERS

RE-POWER NOW with your choice of three famous V-8 engines
FORD • CHEVROLET • MERCURY

CONVERSION KITS now available to fit ALL 2 and 4 Whl-Drive Willys Jeeps. . . . Priced $43.28 to $64.75 . . . If you want fast action tell us which V-8 engine you wish to use . . . give us the year . . . 2 or 4 Whl-Drive . . . body style of your vehicle. Send min. $15.00 dep. and we will ship correct kit, bal. C.O.D. Send full amount for prepaid shipment. Wire, phone or write for FREE details.

HOOSIER MACHINE PRODUCTS CO.
314 S.E. 6th St. Phone 676 Pendleton, Oregon, U.S.A.

GUNS AUTHENTIC REPLICAS

Reproduced in Actual Size, Design and Balance. Made of Solid Cast Aluminum. Finished in Gun-metal Black

START COLLECTING NOW!

- German P-38
- Colt Cobra .38
- German Luger
- German Mauser
- Spanish Mauser
- Russian Tokarev
- Italian Beretta
- Japanese Nambu
- Frontier .44 Colt
- Belgium Automatic
- Colt .45 Automatic
- Czechoslovakian Pistol
- S & W .38 Police Special

Special! 2 for $5.00 ppd.!

Colt Cobra .38

$3.00 EACH POSTPAID
Folder, 10c

He-man trophies for Den, Rumpus Room, Cabin, Etc.
Absolutely safe—Cannot be fired

© 1956
LYTLE NOVELTY CO.
2656-S-4 Fashion Avenue
Long Beach 10, California

Send Cash, Check or M. O.
No COD'S - No Canada Orders
Add 4% Sales Tax in California

GUARANTEED SOLD AT LESS THAN WHOLESALE PRICES

Guaranteed fastest runabout of its length. Made of Owens Corning fiberglas with duraluminum trim. Takes outboards up to 75 H.P. Made in off season to give work to decoy plant. Guaranteed $1,600 retail value. Leave outside year round. Years ahead styling. Unconditionally guaranteed.

$461.00 Equipped As Shown FOB Waseca

SEND FOR CATALOG DEPT. DAFW

HERTER'S Waseca, Minn. Since 1893

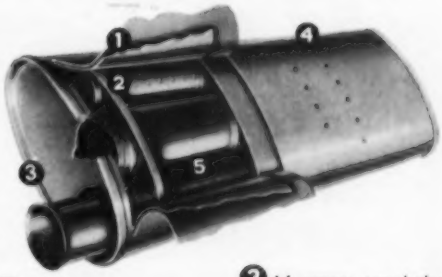
SAVE MONEY THREE WAYS WITH A SILENTONE MUFFLER!

The moment you install a Silentone on your car, you start saving money in three ways. Look at this!—

1. LONGER MUFFLER LIFE — Silentone is a heavier muffler, with double-wrapped, up to ⅓ heavier shell, heavier outer heads and tubes; this gives you thousands of extra driving miles.

2. BETTER MILEAGE—Silentone's scientific design lets your car run quieter—more efficiently, too, reducing exhaust back pressure to give more pickup and smooth acceleration. And with improved performance you get real savings on gas.

3. LOWER FIRST COST—Despite their extra performance and longer life, Silentones actually cost you less. Many stores will install a Silentone for you at big savings. Ask about one today. They're individually engineered for your car.



1. Double shell—26 gauge inner shell, 22 gauge outer shell—lasts longer
2. Nonclogging extruded holes—no whistling, no restriction
3. 16 gauge spun locked, blowout-proof steel heads
4. Crimped seams eliminate weak points
5. High and low frequency tuning chambers

SOLD ONLY BY AMERICA'S LEADING AUTOMOTIVE CHAIN STORES

SILENTONE MUFFLERS • DYNATONE • GLASS-PACKED
Dept. 4D, Toledo 1, Ohio

Special Introductory Offer $5.00 OFF!

WALTCO'S NEW **ny-o-lite** nylon SPINNING REEL

For the easiest, most enjoyable fishing of your life, get a NY-O-LITE Spinning Reel. Needs no lubrication, nothing to rust or corrode, impossible to backlash, weighs only 5 oz., tougher than steel. **5-year warranty.**

Try NY-O-LITE at our risk. Once you've **proved** it's the greatest reel, you'll rave about it to your friends, creating a demand for NY-O-LITE reels that WALTCO Dealers everywhere are ready to fill. For this favor from you, we'll send you this $13.50 reel at $5.00 OFF! . . . you send only $8.50 postpaid (No C.O.D.'s). This offer limited to the first 5 orders from any County in U.S.A. You'll have 30 days to use it on our money back Free Trial Offer. Order Today!

WALTCO PRODUCTS, Dept. H-1
4601 S. Western Blvd., Chicago 9, Ill.

NEW 1957 GEOPHYSICAL YEAR MODEL OF GENUINE 135-POWER ACHROMATIC TELESCOPE

with Achromatic Lens and 4-POWER FINDER attached

ONLY $18.95 PREPAID

EXTRA BONUS GIFTS:
- 273 page book, "Handbook of the Heavens"
- Magic Star Finder Dial
- 220X & 400X Eyepiece lenses

5 Magnifications 18X-35X-65X-85X-135X

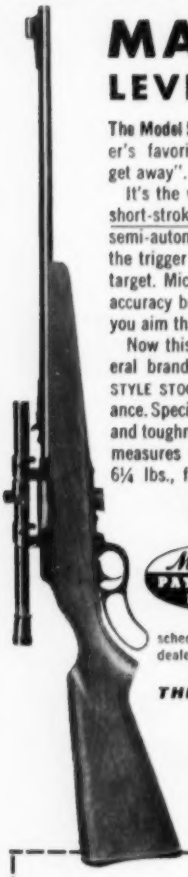
Never before has an **ACHROMATIC** 135X telescope with range finder and tripod sold for anywhere near this amazing low price. Positively shows planets, stars, craters, people and all distant objects. Compound Achromatic coated lens guarantees performance. Adjustable 18X-35X-65X-85X-135X for any condition of brightness, greater range of powers, color free needle-sharp views only possible with Achromatic corrected lens. Trimmed with gleaming brass extends to 43". 4X finder (30 MM Lens) scope gives brilliant clear views, brings difficult objects on target before viewing with main scope. 5 ft. folding tripod equipped with heavy cast iron head fitted with Criterion's famous universal 360 degree aluminum mount assures stability, locks in any position. Remote controls. This amazing 135X Achromatic obtainable only from Criterion. Shipped ready for use together with 4 bonus gifts: 273 page "Handbook of Heavens", Magic Star Finder, also 220X & 400X eyepiece lenses free for experiments. Shipped complete, nothing else to buy at amazing price of $18.95, without tripod $14.95.

ALSO SPECIAL 40X-80X-120X TELESCOPE WITH TRIPOD . . . . . $11.95 Post Paid

5 section telescope with 5 precision lenses, opens to 36" closes to 12". 5 ft. hardwood tripod, cast head aluminum 360 degree mount. Erect clear images. Bonus gifts: 273 page Handbook of Heavens, Star Finder. You must be completely satisfied with these instruments or money promptly refunded. Send cash, check or money order today.

Dept. PST15, Criterion Mfg. Co., 331 Church St., Hartford, Conn.

Get 'em... with Blazing Speed, Pin-Point Accuracy!



MARLIN 56 LEVERMATIC .22

The Model 56 Levermatic—the small-game hunter's favorite—"gets the ones that used to get away".

It's the world's only rifle with revolutionary short-stroke action that lets you fire at almost semi-automatic speed, keeping your finger on the trigger . . . and your sights glued on your target. Micro-Groove Rifling*, with its 20-25% accuracy bonus, puts your shots exactly where you aim them.

Now this trail-blazing design embodies several brand-new improvements: NEW BISHOP-STYLE STOCK provides perfect "feel" and balance. Special finishing gives stock greater beauty and toughness. Modern in design, the Marlin 56 measures only 41" overall and weighs about 6¼ lbs., for faster handling.

$49.95** without scope

Marlin PAY-LATER PLAN

The Marlin Pay-Later Plan puts your 56 Levermatic in your hands immediately, for only $4.95 down-payment! You choose the monthly payment schedule that fits your budget. Ask your Marlin dealer for the simple details.

THE NAME FOR GAME

Marlin

FINE GUNS SINCE 1870

*Patent applied for. **Slightly higher west of the Rockies. Subject to change without notice.

MARLIN FIREARMS CO. H-47
P.O. Box 995, New York 17, N. Y.

Please send me your catalog with photo illustrations and complete descriptions of all Marlin Guns. Also send me the new, profusely illustrated 16 page "Marlin Target and Game Record Book", for my personal shooting records. I enclose 25¢ for handling.

Name.....

Address.....

City.....Zone.....State.....

AMMUNITION

for a fraction of regular cost

Reload a whole carton for the cost of a few rounds of factory ammunition. Shotgun shells, rifle and pistol cartridges can be reloaded safely and easily with an inexpensive set of famous IDEAL Reloading Tools. 164 page IDEAL Reloaders Handbook . . . $1.00, postpaid. Free folder on request.

THE LYMAN GUN SIGHT CORP.
MIDDLEFIELD, CONN.

43 Models 8 ft. thru 18 ft.

$39.25 Up Freight Pd

EQUAL TO FACTORY BUILT BOATS

Luger Kits Save you ½ to ⅔ Cost

Assembled and finished by inexperienced owners. Luger kit boats equal factory-built in style, beauty, speed, handling. Send for BIG catalog showing cruisers, runabouts, convertibles, fishing boats; also Fiberglas, hardware, trailers, accessories.

BOAT KIT CATALOG Free!

LUGER INDUSTRIES, INC. DEPT A-4 3404 Lyndale So. Minneapolis 8, Minn.

1957 PERKO NO. 156 SMALL BOAT EQUIPMENT CATALOG

Chock full of NEW and MODERN items.

84 Pages full of Equipment for Small Boats, Outboards, Runabouts, etc.

SEND FOR YOUR COPY TODAY

Include 25¢ to cover cost of Mailing and Handling.

PERKINS MARINE LAMP & HARDWARE CORP.
1946 PITKIN AVE., B'KLYN 7, N. Y.

BIGGER! BETTER! FINER! FASTER!

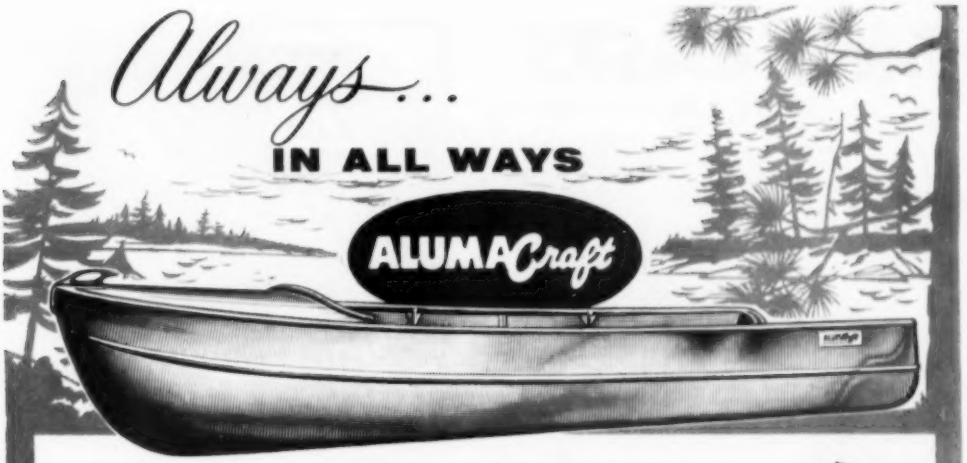
PENN YAN boats

. . . this year's line of leaders includes luxury outboard runabouts, Trailboats, Cartops® and canoes. Types for cruising, fishing, skiing, racing. New work-free, leak-proof constructions, new treatment with germicide under pressure that proof-tests, adds years to boat life.

FREE CATALOG: 44 pages, color illustrations.

Write Today!

PENN YAN BOATS, Inc.
35th St., Penn Yan, N.Y.



For the boat that meets your every need, that fits the power you want to use, that gives you top, safe performance, that's always dry and ready to use, select a Swenson designed Aluma Craft. Strong, light, easily handled and transported, it will give you years and years of trouble-free fun. See your Aluma Craft dealer or write for catalog showing 17 models including 5 brand new ones for 1957.

New catalog shows 17 boats in color. Gives suggestions on how to select model to fit your motor and needs.

ALUMA CRAFT BOAT CO.

2627 27th AVENUE SOUTH • MINNEAPOLIS 6, MINNESOTA

looking for the shortest route?

... find it in a moment with

MILE-O-GRAPH

measures mileage ... without arithmetic

SET SCALE by turning knob on end

READ EXACT MILEAGE shown by pointer thru magnified window

MEASURE MILEAGE by running wheel along map route

Find the fastest, shortest route *yourself*, on any scaled map, with this amazing, patented mileage measurer. Easy as 1-2-3—no figuring. Precision MILE-O-GRAPH adjusts to any map scale, fits into pocket or purse. Saves time, tires, temper. A welcome gift, perfect for motorists. MILE-O-GRAPH also adaptable for measuring air and sea charts and blueprints.

SETS TO ANY SCALE ON ANY SCALED MAP

ONLY $2 EACH OR 3 FOR $5 gift boxed

MONEY-BACK GUARANTEE.

we pay postage on prepaid orders

MILE-O-GRAPH, INC., Dept. PS-4, 117 Liberty St., N. Y. 6

Please send . . . Mile-O-Graphs at $2 each or 3 for $5.

Enclose find $..... or send C.O.D. I will pay postman.

NAME .....

ADDRESS .....

CITY & STATE .....

GOODBYE TO SHOUTING!

Shout no more! **Now, with a lightweight, self-contained University POWRPAGE, your voice is projected clearly, distinctly. The POWRPAGE is ideal for sporting events, coaching, boating, church bazaars, picnics...literally anything requiring portable soundcasting. Just press button and talk! No waiting for warm-up. Two different types for every need.**

MODEL PP-1 Uses seven standard flashlight cells. Stands free or hangs from any convenient structure. Microphone has long 11 ft. cable for complete freedom of movement. Completely weatherproof. *Greatest power and voice clarity in portable soundcasting!* **$69.75 User Net** (less batteries)

MODEL PP-2 Where maximum compactness and freedom of action are desired. Weighs only 4¼ lbs. Uses six ordinary "pencil" batteries, or may be powered directly from 6 or 12 volt D.C. of car or boat ignition system. Completely weatherproof. **$65.00 User Net** (less batteries)

See your local electronic parts or marine distributor. For literature and further information, write Desk 855, **University Loudspeakers, Inc., 80 So. Kensico Ave., White Plains, N. Y.**

LISTEN *University sounds better*

EASY CASTS
QUICK AS A FLASH

Shakespeare
PUSH-BUTTON WONDERCAST

Just a push of the button . . . a s-w-i-s-h of the rod . . . *presto!* You're *push-button* fishing! All the good attributes of bait casting *plus* the benefits of fixed-spool spinning are combined for *backlash-free,* "magic" casts of live bait, light or heavy lures. Ask your dealer about its advanced design, trouble-free performance, and rugged construction. Sparkling duo-tone black finish, non-reverse crank; outer cone turns for quick drag changes. Easy to handle bait casting crank. All outstanding features to help everyone catch more fish—*have more fun!* No. 1775 (filled with 125 yds. 6 lb. monofilament) $19.95

"FISHIN' FUN" FOR EVERYONE

5 BRAND NEW FISHING BOOKLETS AND CALENDAR FREE!

Latest in fishing tips and tricks by the experts. Covers spinning, bait casting, push-button, fly and saltwater fishing.

SHAKESPEARE COMPANY
Dept. PS-4, Kalamazoo, Michigan

Please send me your 5 brand new fishing booklets and calendar, free!

NAME _____

ADDRESS _____

CITY _____ ZONE ____ STATE _____

Different . . . dashing . . . durable! The New 'better-built' Wolverines offer more for your investment. Wrap around windshields, upholstered seats, individual color styling. Many models in molded plywood and aluminum at popular prices. Literature upon request.

WAGEMAKER COMPANY
Dept. 24-57 Grand Rapids, Michigan

OVERLOAD SPRINGS

$11.95 Per Pair postpaid
2000 LB. SIZE $14.95

For cars and trucks. Front or rear. Gives 2000 lbs. extra capacity for all ½, ¾, and 1 ton trucks; 500 or 1000 lbs. extra for all cars. Easily installed. Guaranteed. State make, model, and year.

BRINKMAN MANUFACTURING CO.
5401 W. 21st Dept. 647 Topeka, Kansas

NEW! Lowest Priced 25 Cal. FEATHERWEIGHT
Beretta Bantam
The World's Most Famous Pistol . . .
Only The Best When Your Life's At Stake!
Featherweight · Sensational · 7 Shot

Std. Blue 32.00
Std. Blue, Pearl Handles 37.50
Deluxe Chrome Pearl Handles 43.50

Sensational NEW Beretta Bantam carries more cartridges for its size and weight than any other pocket pistol. Always—dependable, reliable, and accurate. Fits pocket or purse.

FREE! *GENUINE LEATHER HOLSTER ORDER by MAIL TODAY*

Send $5.00 down, bal. C.O.D.

GODFREY IMPORT CORP., Dept. 4PS, 261 Broadway, N. Y. 7, N. Y.

ONLY $399 Freight Included FREE FOLDERS

NEW 18 ft. OFFSHORE CRUISER KIT

17 Models as low as $42.00 (freight included). Fiberglass boat covering kits, marine supplies, etc.

Tops and side curtains available!

TAFT MARINE WOODCRAFT
Dept. PS-457 636 29th Ave. N. E. · Minneapolis 21, Minn.

Your boat is safe
with "PERMA-DOCK" MOORING BARS

Small craft are safely, conveniently moored to docks with Perma-Dock Mooring Bars. Strong springs attach to bow and stern . . . boat rides easily with waves yet never bumps or rubs dock. Bars are easily attached to dock . . . fold flat when not in use. **"PERMA-DOCK" METAL BRACKETS** . . . offer a quick, low cost way to erect and take down a stronger dock without ever working in water!

Write for Circular on "Perma-Dock" dock brackets, float brackets, mooring bars, ladders, outboard motor carts and hoists.

Central Machine Works Co. 1236 Central Avenue, Minneapolis 13, Minn.

Sgt. 1st Class Edmund L. Reel
Army Recruiter, Sutton, W. Virginia

"He got me the leadership training I wanted"

"I entered service just the way I wanted to, thanks to my Army Recruiter. He was a nice fellow and gave me the straight talk on enlistment opportunities. With his help, I chose my branch of service *before* I enlisted. Now I'm a tank commander in Armor. It's plenty exciting to have all that power at your command. But, more than that, I got real leadership training—great instruction and schooling that's taught me to handle responsibility, make important decisions. You really owe it to yourself to see your Army Recruiter and find out the best way for *you* to plan your service career. I'm sure glad I did, because I've found being a leader is a real mark of prestige!"

Thomas R Cogar

M/Sgt. Thomas Cogar
Gassaway, West Virginia
Graduate, Gassaway High School

YOUR ARMY RECRUITER CAN GIVE YOU THIS SAME SPECIAL DEAL

The Army Recruiter in your home town will show you how to pick your spot in the Army the same way Tom did. He'll show you how you can choose your Army branch *before* you enlist. Infantry, Armor, Signal Corps, Army Medical Service, Engineers, Artillery, Ordnance, Airborne—name it, and it's *yours*! You'll get great leadership training right in your field—be in a position to climb to an important job of responsibility and decisions. Your Army Recruiter is ready to help you, so visit your local Army Recruiting Station today! Remember, there's no obligation!

GET CHOICE, NOT CHANCE, FROM YOUR ARMY RECRUITER

Faster paste waxing!

Easier paste waxing!

Start right in waxing!

Johnson's new J-wax does the cleaning work for you!

No extra cleaner needed —nothing else to buy!

J-Wax has just what paste wax needed—a built-in cleaner! The exclusive J-Wax formula goes to work fast. Cleans while it waxes—saves you hours of work. J-Wax replaces grime with a glistening coat of wax. *Tough* wax. *Hard-finish* wax that protects your car in any weather.

J-Wax puts more wax on your car—*leaves* more wax on your car than other one-step waxes. And J-Wax goes on smoothly, easily—evenly. Leaves no dull spots or streaks. You are sure of more all-around protection with J-Wax in any weather—from bumper to bumper, including the chrome!

Look for Johnson's J-Wax in this new key-opening can. Only J-Wax guarantees sealed-in freshness. It's the fastest, easiest way to genuine wax protection—*paste wax protection!*

"Johnson's Wax" and "J-Wax" are registered trademarks of S. C. Johnson & Son, Inc.

POPULAR SCIENCE
REG. U. S. PAT. OFF. Monthly

Detroit service experts review drivers' reports on the new cars and pass along this inside advice on—

Getting the Most from Your 1957 Car

By Devon Francis

THE owner of a 1957 Plymouth tinkered with the torsion-bar suspension—and ruined his front tires.

The owner of a 1957 Ford used his old chains on his new wheels—and banged a hole in a fender.

The owner of a 1957 Oldsmobile lubricated his vehicle religiously every thousand miles—and wasted money.

These men committed an unforgivable error—they failed to read their owner's manual tucked away in the glove compartment. Cars change from year to year. The instructions on their care and feedings are rewritten every 12 months.

What don't *you* know about your 1957 car? Are you getting the most out of it?

Some instructions and cautions can be applied to all new cars.

- Check your overhangs. If they're substantially longer than those on your old car, your rear bumper may drag with a chain-hoist tow from the front.
- It's more important than ever to

warm up your tires at moderate speeds before mashing the accelerator for long periods. The wheels are smaller and make more revolutions per mile. Tires take more punishment.

- Don't expose the new aluminum trims to caustic soaps, rubbing compounds or steam. They affect the anodic coating. If your finish is acrylic lacquer, don't use anything on the paint for the first 60 days except water. Such finishes take that long to harden.
- To get the most from your tires, at the expense of a slightly harder ride, put a few more pounds in them than the manual specifies.
- Check the fit of your tire chains. If they're too small, you'll have to buy new ones. If too big, remove some links.
- Read the manual for lube, oil and filter-change instructions. Some manufacturers have stretched the mileage between changes.
- Don't try cleaning the new paper carburetor air filters with a solvent or compressed air. They will disintegrate or rupture. Tap them on your heel.
- Check your fuel-tank capacity. Some tanks are bigger, and you may want to keep more gas aboard than you used to, to reduce water condensation and resulting engine stutter.

The following 1957 instructions, car by car, are by no means complete. They are intended to hit only some of the high spots. *Read your owner's manual.*

BUICK

A special hook is required to lift the front end for towing. When jacking for a tire change, look for a locating rivet for the jack pad on the frame; *don't* use a bumper jack. The new wide frame requires adapters on frame-contact lifts at service stations. Be careful in removing the radiator cap; the pressure is up to 15 pounds. Clean or replace the new fuel strainer in the gas tank each 5,000 miles.

CADILLAC

Check the spark-advance setting; it's ahead as much as five degrees, depending on r.p.m. The cooling-system capacity is down a bit; you may need less antifreeze. The battery probably won't need water as often; it's cooled better. You can smoke like a furnace with the new air conditioning: There's full outside-air circulation in place of last year's partial recirculation of inside air.

CHEVROLET

If your Turboglide transmission has "HR" on the quadrant and the fellow's next door reads "GR," don't fuss. It's the same thing. In later '57 models Chevy changed its Hill Retarder to Grade Retarder to prevent anyone's thinking it meant High Range. For push starts, shift from Neutral to GR at 25-30 m.p.h. For warm-engine starts with fuel injection, press the accelerator clear to the floorboard while cranking; it keeps enrichment to a minimum. Remove and replace tires on the new, smaller rims from the inboard rim side only; the outboard side of the rim has a bigger bead seat area.

CHRYSLER

In adjusting car height with the hex nut on the torsion bars, be certain to recheck the wheel alignment; changes in bar tension affect the front-end geometry and can result in excessive tire wear. Drain and clean the radiator in the spring and fall. With air conditioning, you will need permanent antifreeze in your radiator even during the summer to keep from freezing the water in the heater core. Change the paper element in the air filter each 15,000 miles; see the admonition above on cleaning it.

DE SOTO

Most of the instructions on Chrysler apply also to DeSoto, Dodge and Plymouth. Your engine oil capacity is up one quart to five, your cooling-system capacity (with heater) down three quarts to 21. The spark advance on the FireDome is six degrees before top dead center; both the FireFlite and the new FireSweep engines are also advanced to six degrees.

DODGE

Twenty-two pounds rear, 24 front, is specified for the tires; better add at least a couple. The same figure is used for all other Chrysler Corporation cars, the Plymouth V-8s excepted. On Dodge station wagons, be sure the window is lowered fully into the gate before lowering the gate. Penalty: breakage. The spark advance on the six-cylinder is zero; that on the Coronet V-8, six degrees. Don't fiddle with the innards of the air conditioner; if moisture gets in, it will freeze and you've got trouble.

FORD

You no longer have to drain the oil to change the filter; a check valve retains it. The clock is self-regulating but requires some resetting; it runs faster each time you set it ahead, slower when you set it back. Your gas-tank capacity is 20 gallons, up 2½ in a sedan or coupe, one in a wagon. The filter on the fuel pump should be changed each 5,000 miles; it can get clogged. The hood latch now opens from the driving compartment. Don't use any type of cleaning fluid on the vinyl convertible top (and did you know how easily that rear window zipper will work if you rub it now and then with a bar of soap?).

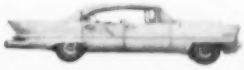
HUDSON

Your V-8 now requires premium gas. The company recommends a 24-pound tire pressure all around. Your old chains may fit, but check. In Low Range with a Hydra-Matic, stay below 35 m.p.h. to prevent an upshift from second to third gear. The change from Drive to Low Range can be made at any car speed, but "L" will not engage until the car gets below 43 m.p.h. Don't engage Reverse at forward speeds above five m.p.h. Your differential takes four pints of lubricant, up a half-pint, and your cooling system's capacity is 20 quarts—down two from last year.

IMPERIAL

The spark advance is six degrees before top dead center. Your cooling system capacity is 25 quarts, up one, your gas capacity 23 gallons, up two. The new TorqueFlite transmission takes 10½ quarts, a pint less than the PowerFlite. The transmission automatically shifts to Neutral if the Reverse button is pushed above 10 m.p.h. The magnetic-clutch brushes on the air conditioner should be checked every 10,000 miles.

LINCOLN



Some models are 500 pounds heavier, and the factory recommends more care than ever in "breaking in" the brakes. A minimum of 250 "burnishing stops"—moderate brake applications from 40 m.p.h.—should be made, as many as 400 if possible, at intervals at least a mile apart. That flashing light on the fuel indicator means you have about four gallons left. If you turn the switch on the electric door locks, and the light doesn't go off, remember there's a door open.

[*Please turn the page*]

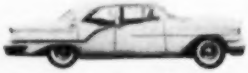
MERCURY

Tap the dirt off that paper carburetor air cleaner each 4,000 miles. There's a change in engine oil specifications. Now, Merc says, use "MS" or "DG" heavy-duty detergent oil. The controls for the heater and air inlets are now separate. Don't worry if, when you press the windshield-washer button, the wipers make 12 or 14 swipes after the water shuts off; it's a coordinated control. Clean the air filter on the air conditioner in warm water at least once a month. Don't drain out the factory-supplied differential lubricant. And there's no longer a seasonal or periodic refill. When needed, use a hypoid gear lube specified by the factory; it contains a sulphur-chlorine-lead additive.

NASH

Your car is now four-eyed: On high beam, your upper headlight is on the high-beam filament, and the lower headlight is on. On low beam, the upper headlight is on the low-beam filament, and the lower headlight is off. Gear engagement for a push start with an automatic transmission used to be 20 m.p.h. or above; now it's 30. Multi-viscosity oils are okay. Fuel is now premium.

OLDSMOBILE



You'll need new tire chains probably. Lube your car each 2,000 miles instead of the former 1,000 (but first see page 172 of this issue). The rear overhang on the 88 and Super 88 is up four inches, that on the 98, 3½. The air cleaner can go an extra thousand miles—6,000—between cleanings. Clean the crankcase breather cap when you change the oil. You can go 8,000 instead of the former 7,000 miles between front-wheel repackings. An extra thousand miles—6,000 in all—is recommended between wheel switching.

PLYMOUTH

Recommended tire pressures differ from those for the rest of the Chrysler Corporation's cars; it's 24 pounds in front, 22 rear, for the V-8s. But it's 22 pounds for the Six. Your fuel capacity is up three gallons to 20. That rumor that the torsion-bar suspension needs adjusting each 2,000 miles is eyewash. If you've got a pot that has four barrels, use a premium gas. The multi-viscosity engine oils are okay.

PONTIAC

Oil-pump pressures are down; where the top used to read 80 pounds, it's now 60. A spare 7½-ampere fuse is now clipped to the bottom of the fuse box. With a manual transmission, pressing the accelerator to the floor presets the automatic choke and throttle for cold starts. Cooling-system capacity is down to 23¾ quarts, even with air conditioning, and the seven-pound radiator pressure cap is replaced with a 13-pounder (15, with air conditioning).

RAMBLER

The V-8 drinks regular gas, like the Six. The cooling system takes 21 quarts with heater, almost twice that of the Six, and the crankcase five quarts, less filter. Pump up those tires to 24 pounds. Your chains will probably fit.

STUDEBAKER

A first this year is the disposable oil filter you can change yourself. It's coated with an abrasive on top so you don't need tools—work it off by hand; screw a new one in. Its life is 5,000 to 6,000 miles. If you own the Golden Hawk (or Packard Clipper), check every 1,000 miles on the automatic-transmission fluid that lubes the supercharger. END

Detroit Report:

What's Coming in 1958 Cars

THE chips are down. Detroit's tooling for the 1958 crop of cars is almost finished. From now on, all that the stylists will be permitted to do is move a little chrome around.

The model year of 1958, to be ushered in this fall, will introduce the first new brand name in cars in more than seven years—discounting the Packard Clipper and the sports cars. Ford Motor will bring out its ***Edsel.*** The last time that an event like this occurred was in 1950, when Nash unveiled its Rambler.

The Edsel will come in four "series" or lines. The top two —called the Citation and Corsair—will be built on a Mercury frame. The bottom series —Pacer and Ranger—will go on a Ford frame. Fourth car in the Ford stable (sixth, if you include Thunderbird and Continental), the Edsel will sell—according to Detroit scuttlebutt—for $2,200 to $2,700 f.o.b. factory at the low end; $3,000 to $3,500 at the high end.

Chevrolet's regular lines of cars for 1958 will be drastically restyled. The silhouette will be dropped four to five inches. But that familiar tuck in the sheet metal at the belt line will be retained. Fins will enclose the rear deck, but they will be conservative.

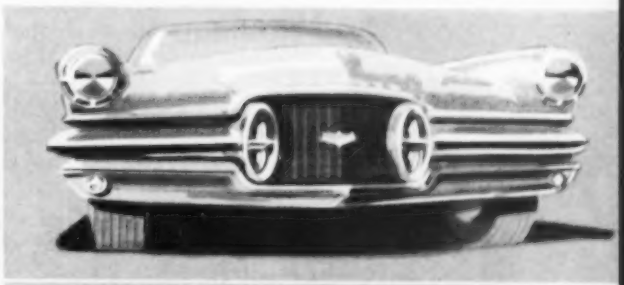
Chevrolet will bring out some version of the ***Impala,*** the fancy-pants show car, with Corvette in its ancestry, exhibited at the GM shows in 1956. The sages say there will be a new V-8 engine.

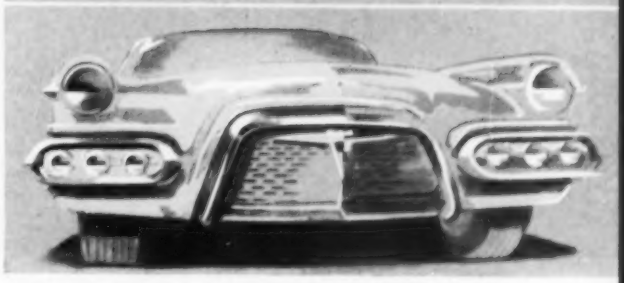
Big changes are due for American Motors' ***Rambler,*** too. A lot of people inside the company don't cotton to the gingerbready look of the 1956-57 version. And it's going to surprise those prophets who keep dooming the Nash and Hudson to extinction when both appear this fall in sparkling new dress.

Lincoln in 1958 is going to the "unitized" construction pio-

Hottest question in Detroit this spring is: What will the new Edsel look like?

Edsel in Evolution





These two sketches by Ford Motor Co. stylists were among those from which the final appearance of the car was evolved. But the production design will be secret until late summer.

neered by Nash. That means the entire absence of a frame, as such. The frame for the body becomes the frame for the entire car. In manufacture, the body is dropped onto the running gear, locked there—and that's it. This may well forecast things to come at Ford Motor. The ***Thunderbird*** will be next to abandon its frame.

Chevrolet has been flirting with the same idea. Its current firewall- and instrument-panel construction is a step in that direction. When work on new Chevy assembly plants in Ohio and California suddenly was stopped some months ago, the rumors swept Detroit that this GM division was torn between adopting Cadillac's X frame and going frameless altogether.

Pontiac in 1958 will have its own body shell for the first time. A sheet-metal panel or two will be shared with Chevrolet, but the duplications will be minor.

The ***Studebaker*** will be sheathed in new sheet metal.

There will be a "big" ***Mercury*** in 1958. It may bear a series name plucked from a list of 2,000 submitted for the car they finally decided to call the Edsel. The big Merc in some measure will overlap the Lincoln in price. It will compete with the Olds 98 and the Buick Roadmaster.

Something exotic is in the offing for the plush ***Continental.*** Brought out as Ford's prestige car for the 1956 model year, it has not found enough coarse money among buyers to pay its way. There are reports that it will appear as a four-door sedan or hardtop, with more room inside, to make it more acceptable to people having $10,000 to spend.

Optional air suspension will probably be available on some Ford Motor and GM cars in 1958. There are also indications that disk brakes will again be offered; almost every company is working hard on brakes. Lincoln, among others, is thinking of *air* brakes.

NEXT MONTH: *In the market for a brand-new automobile? Don't miss "How to Buy a New Car"—a 16-page booklet included in your copy of May* POPULAR SCIENCE. *This step-by-step guide covers every angle—trading in, dealing with dealers, insurance, financing, extras, servicing—and shows you how to get the best deal for your money.*

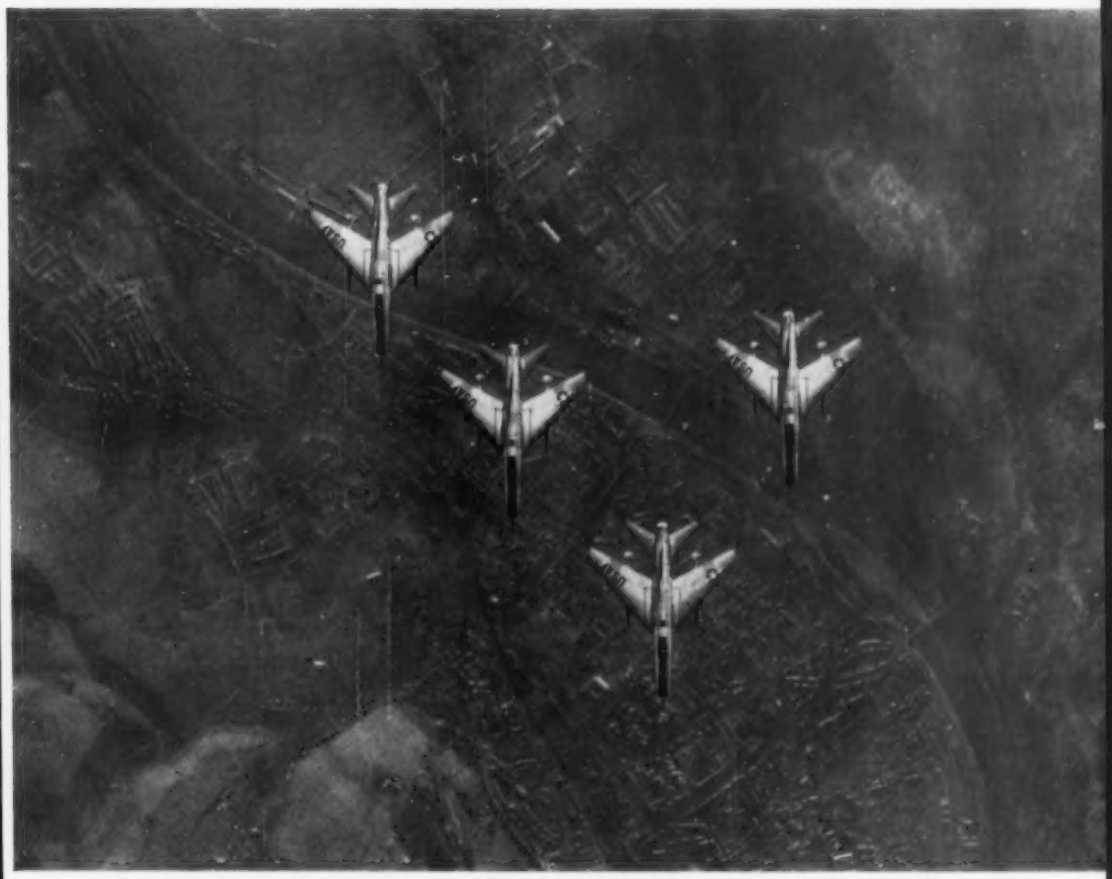
Look for a growing adoption of fuel injection in 1958. At least three systems are proved and ready for manufacture—the Bendix, going into a limited number of Ramblers this spring and, later, into some Chrysler Corp. cars; the American Bosch; and the Simmonds, under current study by Ford, Buick, Oldsmobile, DeSoto and Chevrolet. One Ford engineer said the trouble with *all* fuel-injection systems was cost—the car buyer would have to ante up $500 for a unit. Actually, Ford's own estimate of manufacturing cost on a volume basis for one kind of unit is $50.

A big push will be made by all the Detroit manufacturers on the sale of air conditioners in 1958. The motormakers suddenly discovered that Texas manufacturers of air conditioners for cars were striking gold. Prices are dropping. Factory-installed units, *including* a heater, come as low as $345, and "hang-ons" installed by the dealer and *not* including a heater, even lower.

[*Continued on page 280*]

Ready to roll from hidden hangars—

U. S. Jets Keep Watch on the Rhine



Four North American F-100 Super Sabres fly over the Rhine in American Zone of Germany.

U. S. AIR Force Day Fighters of 36th Group—the famous F-100 Super Sabres—are stationed at Bitburg and Hahn, in Germany, and at Soesterberg, in Holland. They are supersonic jets, armed with rapid-firing 20-mm. cannon.

Their mission: to provide quick reinforcement for any "brush-fire" war that might break out suddenly in Europe or the Middle East. Their presence clearly shows all observers—friendly or otherwise—that the U. S. Air Force is on the spot, ready to go, so that mistakes in power-grab calculations are not so likely to happen. Other F-100s, able to deliver atomic bombs, are based in France, 100 miles behind Bitburg.—*Frank Harvey.*

For more pictures of the F-100, turn the page

"Watch on the Rhine"

HOT TO TROT: Jet pilot signs in on Alert bulletin board. He's buttoned into his G-suit, and his F-100 waits in concrete cubbyhole on lower level. Note the silhouettes of Russian planes.

GROUND POWER UNIT, to start jet engines, is flicked into action by men who get least share of glory—the plane handlers. They live in hangar, never more than seconds away from job.

Huge mound is the "Zulu" hangar. Zulu is Air Force lingo for "Ready Alert." Deep dirt fill

FOUR 20-MM. CANNON go off at once on boresighting range. Bullets must strike in small circle at 1,000 feet. F-100's split-second firing time makes a fast rate of fire essential.

SUPERSONIC FIGHTERS STAND inside the Ready Alert hangar at Bitburg, Germany. Blast doors, which show black in the photograph, bleed off the superhot gases from fighters' tailpipes. Mas-

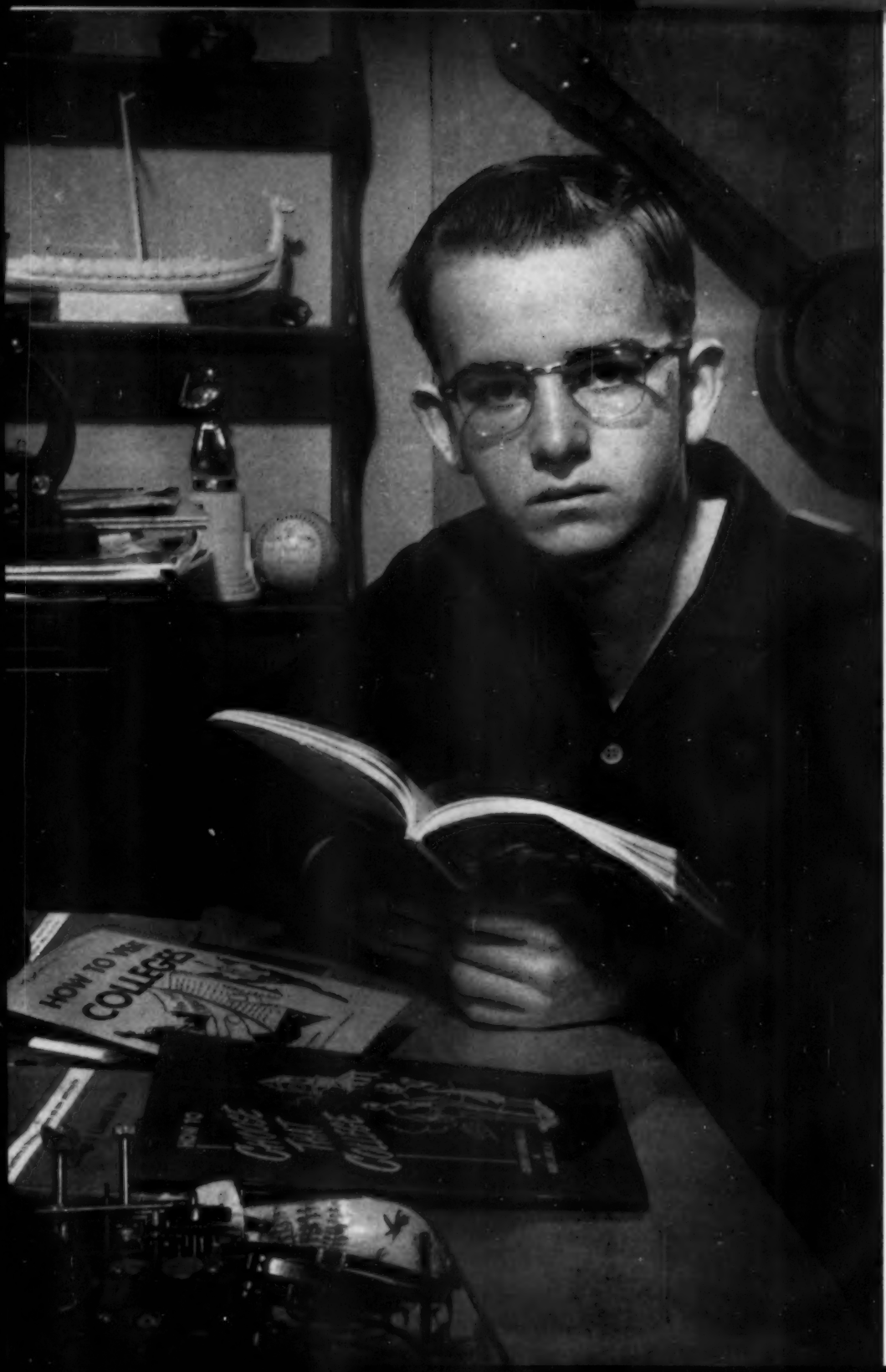
SHOOT ME THE JUICE! Pilot signals with a thrusting finger from the cockpit of his F-100. Five minutes from now he'll be tooling along high over Germany at close to the speed of sound.

AND AWAY FOR A LOOK-SEE. With their speed and ceiling, the F-100s can tackle high-flying bombers or fighters; with mid-air refueling, they can strike deep into enemy territory.

around three sides of the camouflaged hangar protects planes from anything but a direct hit.

sively built of concrete and earth, these ingenious cave-type hangars also give protective housing to standby pilots, the F-100 handlers and their maintenance equipment.

IF THE TRAINER LET GO, this K-9 dog would do some serious chawing on sergeant (not shown) flailing at him with a stick. These dogs are taught to distrust every man who walks. END


HOW TO WIN
COLLEGE

Can Your Youngster Get into College?

It isn't easy, and it's going to get harder. Here is what you can do, starting now, to help your son or daughter qualify.

By D. R. Lindsay

AT THE very time when industry, in its hiring, tends more and more to demand college graduates, it is rapidly growing harder for all but the brightest boys and girls to get into college.

You've undoubtedly read or heard that the competition is getting tougher. You have probably asked yourself, "Can *my* youngster get into college?"

The answer now, and for a short time to come, is still "Yes."

If your youngster will graduate from an accredited high school within the next six years and *if you and he start seriously planning early enough*, he can be admitted to *some* college. After 1963, though, at which time the huge throng of postwar babies begins to reach college age, there may no longer be room enough for all qualified applicants.

Even today, getting into college requires long-term, careful planning, and this will become increasingly important as more and more high-school graduates try to go. Unless your youngster is extraordinarily bright, you are going to have to help him in many ways besides arranging loans and signing checks.

Why?

Because unprecedented crowding has forced most colleges to be far choosier than ever before. As the crowd of applicants swells, colleges will become increasingly selective. Even now, thousands of students are being refused by

How You Can Help Us Write These Articles

This is the second article in Popular Science's unusual series designed to help parents do a better job of guiding their children toward the kind of education and career most suitable to their abilities and interests. The right choice is bound to benefit the youngster and the nation, which, with our increasingly technical civilization, needs trained citizens more than ever.

We have gone to the best authorities we could find for information and advice. But the subject of education is huge and complex. The experts themselves often disagree. They don't have all the answers.

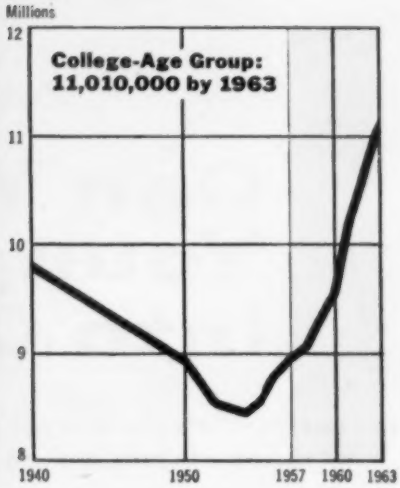
If, in reading this series, you do not find the specific advice you need on some particular phase of your own family's educational problem, let us know. If possible, we will answer your questions, either directly or in future articles.

Next month: "Is Your Youngster a Budding Scientist?"

PHOTO BY HUBERT LUCKETT

Why getting into college is getting tougher...

These graphs are based on projections of data in *Teachers for Tomorrow*, published by the Fund for the Advancement of Education. Estimates of future college enrollment assume that proportion of college-age youngsters who actually enroll in college will keep rising at the rate of two percent a year, as it has since 1954.



the schools they want most to attend.

Last year, Dartmouth had five applicants for every place in its freshman class. Caltech had almost as many. Yale had four; Princeton, six. Mt. Holyoke College took in only one girl out of every five who applied; Smith College, one out of four.

Even one of the biggest schools in the U.S., New York University, accepted only one applicant out of every three.

These all are private institutions. But the state-supported universities, sharing in the crush of applicants, are getting restrictive, too.

The University of Colorado insists not only that applicants pass College Board exams but that they be in the upper two-thirds of their high-school classes. The University of California, the nation's largest, demands a B average from high-school graduates seeking admission. The University of Michigan, planning in 1959 to start requiring applicants to pass College Boards, already has begun limiting the number of out-of-staters admitted. The University of Massachusetts no longer accepts *any* out-of-staters; furthermore it is thinking of admitting only students who have ranked in the top 20 percent of their high-school classes.

Today, 3.2 million young men and women—nearly one-third of the college-age population of the U.S. (see graph on page 95)—are enrolled in colleges. That's an all-time record.

Despite this fact, there is still room for the high-school graduate of average scholastic ability. The room exists primarily in private colleges that are not widely known, and—for the time being—in state universities.

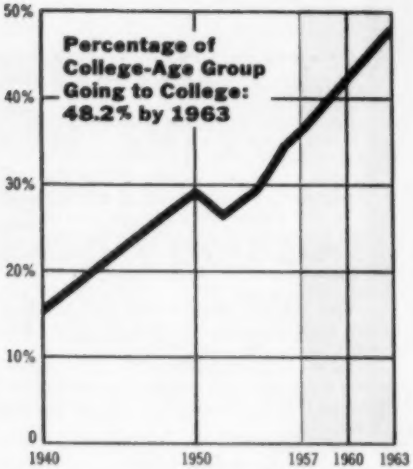
A 1956 survey in Illinois revealed that private colleges in that state alone could accommodate an additional 25,000 to 30,000 students. The Council for the Advancement of Small Colleges, with headquarters in Washington, says 54 of its member schools throughout the nation can absorb 50,000 more students.

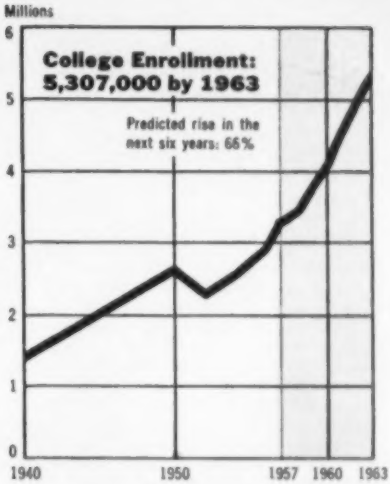
But by 1963, if the U.S. population continues to grow at its present pace and the proportion of young men and women going to college keeps on increasing at its current rate, U.S. college enrollment will hit 5.3 million. That's a 66-percent increase—in six years!

New campuses are already being built, and old ones expanded, but the outlook for 1963 is for a very tight squeeze to get all the would-be college students in. After that? The prospect is dark indeed.

Even now, there is not much margin for error left to applicants.

First, you and your youngster must





try to answer two important questions: Is he really capable of doing college work? Is college the best training for the career you and he envisage for his tastes and talents?

Tough questions? Yes, and they call for objective answers from you both. Ask your youngster's present school for help. Many schools now regularly give intelligence and aptitude tests. If your youngster's school gives these tests, you can quickly get a realistic guide to his ability to handle the load of college subjects. If it does not give the tests, it can tell you where your youngster can get them. Also, your child's teachers can give you expert estimates of his prospects as a college student.

You must face the possibility that the verdict of tests or advisers will be that your youngster should *not* go to college but should instead take vocational training. A subsequent article in this series will discuss aptitude tests and vocational guidance. Another will explore the field of desirable careers for youngsters who train for specific vocations instead of going to college.

If tests and interviews have convinced you and your youngster that he *can* make the grade in college, it is then largely up to you to see to it that he *wants* to go. You must create a family atmosphere in which it is completely taken for granted that he *will* go to college. This involves establishing a broadening way of life for him that ranges all the way from introducing him to good books to encouraging him to go to dances. You must foster both the intellectual and the social aspects of his life.

While that essential groundwork is being laid, follow this specific procedure:

1 As early as possible—preferably at the time he is ready to enter the ninth grade—help him decide what courses he will take in high school. These should pave the way to the kind of college he and you think he should shoot for.

He must take a college-preparatory curriculum, naturally, but make sure that it includes not only the minimum requirements but also the electives recommended by the type of college he is considering.

The standard college-prep curriculum includes enough English, social studies, elementary math and introductory science to get a student into the liberal-arts branch of the average state university. But many liberal-arts colleges are likely to demand languages as well, and extra social studies.

Without additional math and science, however, the standard college-prep cur-

This is what College Board exams are like

QUESTIONS like these appear in each year's Scholastic Aptitude Test of the College Entrance Examination Board. Each test has a Verbal section and a Mathematics section.

Careful study over many years has shown that tests of this kind often improve the accuracy with which colleges can forecast a student's academic achievement. Though subject to error, like all tests, the College Boards have proved to be a useful supplement to an applicant's high-school record and other personal data in helping colleges judge his merits fairly and accurately.

VERBAL

Directions: Each question below consists of a word printed in capital letters, followed by five words lettered A through E. Choose the lettered word which is most nearly *opposite* in meaning to the word in capital letters.

1. UNFIT: (A) tight (B) qualified (C) chosen (D) serene (E) necessary

2. ADAMANT: (A) unsympathetic (B) moist (C) modern (D) yielding (E) pressing

3. EXULT: (A) commemorate (B) welcome (C) change (D) deny (E) mourn

Directions: Each of the sentences below has one or more blank spaces, each blank indicating that a word has been omitted. Beneath the sentence are five lettered words or sets of words. You are to choose the one word or set of words which, when inserted in the sentence, *best* fits in with the meaning of the sentence as a whole.

4. If your garden plot is small, it will not pay to grow crops which require a large amount of . . . . . in order to develop.

(A) moisture (B) rain (C) fertilizer (D) space (E) care

5. If there is a long succession of styles between the earliest style and the latest one, the . . . . . can appear in a new disguise without being detected.

(A) style (B) earliest (C) latest (D) succession (E) worst

6. The average uneducated person does not distinguish between science and invention, and lumps together those whose work is wholly directed toward . . . . . ends with those who are out to discover principles without much regard for their utility.

(A) inevitable (B) theoretical (C) ideal (D) practical (E) obvious

7. The fathers of the Constitution were . . . . . : the Constitution did not create rights, it recognized them.

(A) originators (B) recorders (C) debtors (D) lawyers (E) wrong

Directions: Each of the questions below consists of two words which have a certain relationship to each other, followed by five lettered pairs of related words. Select the lettered pair of words which are related to each other in the *same* way as the words of the original pair are related to each other.

8. TREE: FOREST : : (A) flower:plant (B) chair:room (C) cloth:fiber (D) voice: chorus (E) mistake:life

9. TRIGGER:BULLET : : (A) handle: drawer (B) holster:gun (C) bulb:light (D) switch:current (E) pulley:rope

10. IMMUNITY:DISEASE : : (A) exemption:tax (B) pardon:transgression (C) debt: obligation (D) conformity:custom (E) adaptation:change

MATHEMATICS

Indicate the *one* correct answer among the five given after each question.

11. In North Dakota the temperature has gone as high as 114° and as low as −45°. How many degrees' difference is there between these two temperatures?

(A) 69 (B) 79 (C) 114 (D) 159 (E) 169

12. A school has 2, 3 or 4 classes each semester in physics, with 20 to 30 students in each class. If 10% of the physics students failed in one semester, what is the greatest number who could have failed?

(A) 3 (B) 6 (C) 8 (D) 10 (E) 12

13. A woman bought X yards and Y feet of ribbon at n cents per foot. How many cents did she pay?

(A) $n\left(\frac{X}{3} + Y\right)$ (B) $n(X + Y)$ (C) $n(3X + Y)$ (D) $n(X + 3Y)$ (E) $3n(X + Y)$

14. How many feet longer is the circumference of a circle 12 feet in diameter than the combined circumferences of two circles 8 feet and 4 feet in diameter?

(A) 0 (B) 2π (C) 4π (D) 6π (E) 8π

15. If $\frac{5}{4}X = 4$, $\frac{4}{5}X = (?)$

(A) $\frac{1}{4}$ (B) $\frac{64}{25}$ (C) 3 (D) $\frac{16}{5}$ (E) 5

16. If a man walks 1 mile north, then 1½ miles west, and then 1 mile north, how many miles will he be from his starting point?

(A) $\frac{1}{2}\sqrt{13}$ (B) 2 (C) $\frac{5}{2}$ (D) $1 + \frac{1}{2}\sqrt{13}$ (E) 3

(Turn to page 262 for the answers.)

riculum is not likely to qualify a student for an engineering college. Nearly all engineering colleges require at least 3½ years of high-school math, including algebra, plane geometry and trigonometry. Some require physics and chemistry as well. Most recommend them.

Leading high schools have guidance counselors who are familiar with the specific requirements of a great many colleges as well as with the individual abilities of the pupils in their schools. If possible, you should go to them for ad-

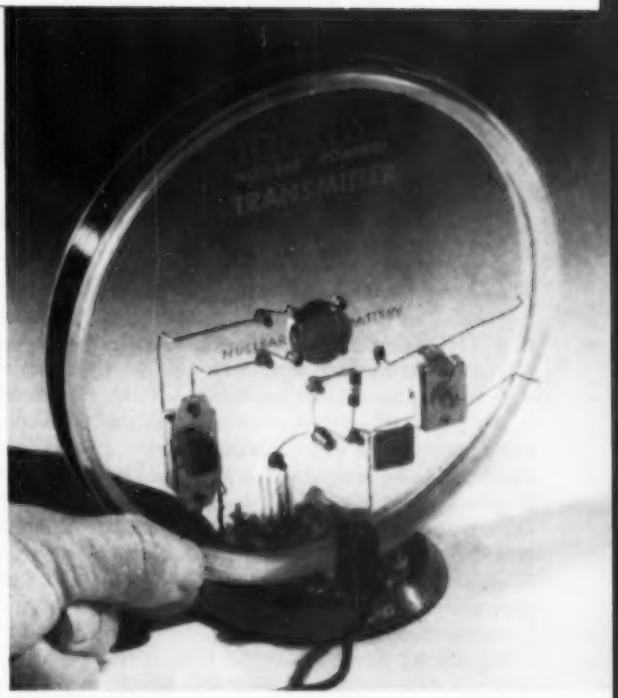
[Continued on page 256]

Atomic Battery Lasts For Years

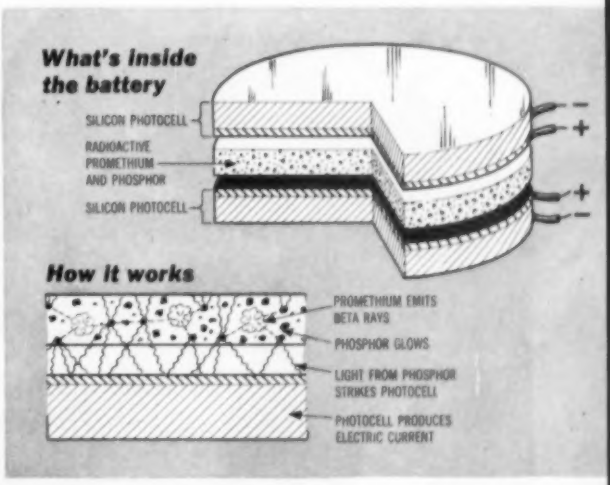
MAN-MADE promethium, a radioactive fission product of nuclear reactors and an element nonexistent in nature, finds one of its first uses in a novel atomic battery. The tiny experimental model shown here, jointly developed by Elgin National Watch Co. and Walter Kidde Nuclear Laboratories, is designed for an electric wrist watch. Others are expected to power portable radios, hearing aids, and equipment in guided missiles and space craft.

First the battery yields light, which it then turns into electricity. Beta rays from promethium-147 oxide make cadmium sulfide, a light-emitting phosphor, glow. Silicon photocells transform the light into 20 microwatts of current, in the present model; larger ones will be more powerful. A $\frac{1}{16}$-inch-thick case of Hevimet-alloy shielding confines the mild radioactivity and amply safeguards the wearer of a watch.

The Elgin-Kidde nuclear battery is said to be immune to heat, cold, and self-damage by radiation. Short-circuiting it does no harm, and power drawn from it doesn't run it down. Lasting as long as its promethium 147 (estimated half life, about 2¼ years), it retains one-fourth of its original power for five years, which is considered its useful life. The promethium it uses, now costly, will become plentiful and inexpensive with quantity production this year.



MIDGET TRANSMITTER with new atomic battery, and token range of a few feet, demonstrates nuclear-power radio.



SMALLER THAN DIME in diameter, battery below is for wrist watch. Its case holds the parts shown above.

Facts and Figures on

How do you choose a lawn mower? Price? Engine? Design? Here's

By Martin Mann

THE song of spring in the suburbs these days is the shrill soprano of the power lawn mower.

It's an even bet that you own a power mower now—half of all POPULAR SCIENCE readers do. You're probably going to buy a new one, too, before long—the life expectancy of a power mower, even if coddled, is around five or six years. This year nearly half of the 2,700,000 mowers expected to be sold will be replacements for old ones.

What kind should you get? Reel or rotary? Big or small? How much should you spend? Which make is best?

You'll find the facts here for a sound decision. The charts on pages 100-101 list detailed specifications on representative mowers (not all mowers—there are nearly 300 brands).

Price. The range is wide, from about $50 up, up, up. But this year you may get a break. The industry expects rough competition as more discount houses and department stores get into the business. That means price cutting. So the "suggested retail prices" given in our chart may turn out to be starting points for bargaining, like the "list prices" of cars.

The retailers who feature the prices that appear most alluring at first glance are not likely to handle the advertised makes listed in the PS chart. But some—not all—of the less familiar mowers are

Reel cuts like scissors

FAMILIAR HAND-MOWER MECHANISM snips grass on reel power mower too. Below is same mower, upright.

New Power Mowers

what you should know to pick the one for your grass-cutting job.

good ones. Check them for desirable points of design described below. Their engines are almost sure to be among the ones specified in our chart. (Be sure to check engine *model* as well as make.)

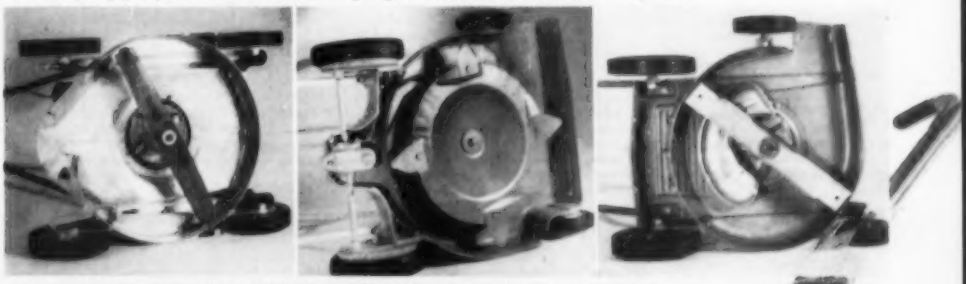
If you can wait until after the Fourth of July, you can take advantage of the end-of-season sales, which start about then. The prices will be better then, but the selection will be limited.

Which type? A few years ago you could liven up a Saturday-night party with a debate over the merits of the reel mower, which is basically a hand mower with an engine on it, compared to the rotary mower, which uses the engine to spin a scythe-like cutter. For the mass market, that argument is about over now: Four of every five mowers sold are rotaries. The secrets of this quick success are simple:

- Low price. A rotary runs $10, more often $20, less than an equivalent reel mower.
- Trimming ability. The rotary cuts outside its wheels and thus can get the grass along walks, under fences or next to the house. With a little practice you can mow close around a tree and leave no blade of grass uncut.
- Versatility. The rotary cuts just about anything. It tolerantly lets you goof off for a week, then slash two weeks' growth of thick grass at once. It chomps through tall weeds. Fitted

[*Text continued on page 102*]

Rotary type, now the most popular, cuts like a scythe



YOU CAN TAKE YOUR PICK of blade and housing designs in rotary mowers. One-piece cutter bar (Penn-Acco, left, Lawn-Boy, right) is most common. Jacobsen (center) uses separate blades fastened to rotor disk.

How They Compare:

ROTARY MOWERS Make and Model	Price	Cutting Width	Weight (lb.)	Engine: Make and Model	Cycles	Horsepower at What R.P.M.	Torque (lb.-ft.) at What R.P.M.	Area of Mainshaft Bearings (sq. in.)	Air Cleaner	Muffler Size (cu. in.)	Starter
WESTERN AUTO Wizard 2X 2708	$ 53	18"	41	Clinton VS 200	2	2.0 @ 3,800	2.8 @ 3,800	1.94	dry	3.4	rope
PENNSYLVANIA 64118-A	$ 55	18"	40	Clinton VS 200	2	2.0 @ 3,800	2.8 @ 3,800	1.94	dry	4.5	rope
SEARS, ROEBUCK Craftsman 5-205	$ 55	18"	42	Power Products 601	2	1.9 @ 3,200	3.1 @ 3,400	a	dry	4	rope
DUO-TRIM MRS-218-7	$ 60	18"	42	Clinton VS 200	2	2.0 @ 3,800	2.8 @ 3,800	1.94	dry	4	rope
REO Revo-Trim	$ 60	18"	35	Power Products V-47	2	1.9 @ 3,600	3.1 @ 3,400	a	dry	4	rope
BOLENS	$ 65	18"	50	Power Products V-47	2	1.9 @ 3,600	3.1 @ 3,400	a	dry	4	rope
HUFFY 180	$ 65	18"	46	Power Products 604	2	2.2 @ 3,200	3.1 @ 3,400	b	dry	30	rope
MONTGOMERY WARD Contender 8328	$ 65	18"	46	Power Products 606	2	2.2 @ 3,200	3.1 @ 3,400	b	dry	30	rope
WESTERN AUTO Wizard 2X 2709	$ 68	18"	52	Briggs & Stratton 6B-HS	4	1.75 @ 3,200	2.85 @ 3,200	1.78	oil	6	rope
GRASS QUEEN 2100A	$ 70	18"	50	Clinton VS 200	2	2.0 @ 3,800	2.8 @ 3,800	1.94	dry	3.4	rope
JACOBSEN Model 50	$ 70	18"	45	Jacobsen J-100-VD	2	1.8 @ 3,200	2.6 @ 3,000	c	dry	12.5	rope
LAWN-BOY Economy-3100	$ 70	18"	38	Lawn-Boy C-20	2	1.85 @ 4,000	2.64 @ 2,800	2.68	dry	57	rope
SEARS, ROEBUCK Craftsman 8802	$ 70	18"	56	Briggs & Stratton 6B-HS	4	1.75 @ 3,200	2.85 @ 3,200	1.78	oil	6	recoil
TORO Whirlirim 18"	$ 70	18"	46	Power Products V-47	2	1.9 @ 3,600	3.1 @ 3,400	a	dry	4	rope
MONTGOMERY WARD Contender 8329	$ 75	18"	49	Briggs & Stratton 6B-HS	4	1.75 @ 3,200	2.85 @ 3,200	1.78	oil	6	recoil
MONTGOMERY WARD 8325	$ 75	17"	50	Power Products 604	2	2.2 @ 3,200	3.1 @ 3,400	b	dry	30	recoil
SEARS, ROEBUCK Craftsman 8810	$ 75	18"	59	Craftsman 143.V20A-1-1-1WA	4	2.0 @ 3,600	3.05 @ 3,200	1.98	oil	8	recoil
WESTERN AUTO Wizard 2X 2715	$ 75	18"	52	Clinton VS 2100	4	2.0 @ 3,600	2.9 @ 3,600	1.70	dry	6.6	recoil
WESTERN AUTO Wizard 2X 2717	$ 80	18"	53	Clinton VS 2100	4	2.0 @ 3,600	2.9 @ 3,600	1.70	dry	6.6	recoil
EXCELLO FC-57	$ 85	18"	55	Lauson V-17	4	1.70 @ 3,200	2.8 @ 3,200	1.98	dry	8.6	rope
LAWN-BOY Special 5000	$ 85	18"	41	Lawn-Boy C-12	2	2.0 @ 4,000	2.64 @ 2,800	2.68	dry	57	recoil
SNAPPER 18	$ 86	18"	50	Briggs & Stratton 6B-HS	4	1.75 @ 3,200	2.85 @ 3,200	1.78	oil	6	rope
BOLENS	$ 88	18"	55	Briggs & Stratton 6B-HS	4	1.75 @ 3,200	2.85 @ 3,200	1.78	oil	6	recoil
EVERSHARP 285	$ 90	19"	56	Briggs & Stratton 6B-H	4	2.25 @ 3,600	3.29 @ 3,600	1.78	oil	6	recoil
GRASS QUEEN 165	$ 90	19"	56	Clinton VS 2100[e]	4	2.0 @ 3,600	2.9 @ 3,600	1.70	dry	6.6	recoil
MONTGOMERY WARD Wardmaster 8330	$ 90	19"	63	Briggs & Stratton[e] 6B-H	4	2.25 @ 3,600	3.29 @ 3,600	1.78	oil	6	recoil
MOTO-MOWER Delray	$ 90	18"	43	Briggs & Stratton 6B-HS	4	1.75 @ 3,200	2.85 @ 3,200	1.78	oil	6	recoil
PENNSYLVANIA Penn Acco 66118-A	$ 93	18"	41	Briggs & Stratton 6B-HS	4	1.75 @ 3,200	2.85 @ 3,200	1.78	oil	15.7	rope
EXCELLO 178R	$ 95	18"	62	Briggs & Stratton 6B-HS	4	1.75 @ 3,200	2.85 @ 3,200	1.78	oil	6	recoil
LAWN-BOY DeLuxe 5100	$ 95	18"	43	Lawn-Boy C-12	2	2.0 @ 4,000	2.64 @ 2,800	2.68	dry	57	recoil
TORO Whirlwind 18"	$ 95	18"	47	Briggs & Stratton 6B-HS	4	1.75 @ 3,200	2.85 @ 3,200	1.78	oil	22	recoil
YAZOO Special	$ 95	18"	65	Clinton VS 2100	4	2.0 @ 3,600	2.9 @ 3,600	1.70	dry	6.6	recoil
HUFFY 4185	$ 98	18"	55	Briggs & Stratton 6B-HS	4	1.75 @ 3,200	2.85 @ 3,200	1.78	oil	6	recoil
SAVAGE Rotor Chief 18	$ 98	18"	52	Briggs & Stratton 6B-HS	4	1.75 @ 3,200	2.85 @ 3,200	1.78	oil	6	recoil
CLEMSON R-430	$100	18"	46	Briggs & Stratton 6B-HS	4	1.75 @ 3,200	2.85 @ 3,200	1.78	oil	15.7	recoil
COOPER Cyclo-Mo 18	$100	18"	46	Briggs & Stratton 6B-HS	4	1.75 @ 3,200	2.85 @ 3,200	1.78	oil	6	recoil
JACOBSEN Model 34B	$100	18"	52	Jacobsen J-125-VS	2	2.0 @ 3,200	3.1 @ 3,200	c	dry	55	recoil
MOTO-MOWER Catalina	$100	18"	50	Briggs & Stratton 6B-HS	4	1.75 @ 3,200	2.85 @ 3,200	1.78	oil	15.7	recoil
ECLIPSE Duo-Master 19"	$103	19"	53	Briggs & Stratton 6B-H	4	2.25 @ 3,600	3.29 @ 3,600	1.78	oil	6	recoil
HUFFY 4187	$105	18"	56	Briggs & Stratton 6B-H	4	2.25 @ 3,600	3.29 @ 3,600	1.78	oil	6	recoil
DUO-TRIM MR-418-7	$105	18"	45	Clinton VS 2100	4	2.0 @ 3,600	2.9 @ 3,600	1.70	dry	6.6	recoil
REO Spin-Trim	$110	18"	72	Reo 5230-7	4	2.25 @ 3,800	3.1 @ 3,800	2.48	dry	18	recoil
ECLIPSE Duo-Master 21"	$115	21"	54	Briggs & Stratton 8B-H	4	2.75 @ 3,600	4.02 @ 3,600	1.78	oil	6	recoil
YAZOO Master	$160	20"	113	Clinton VS 900	4	2.75 @ 3,600	4.0 @ 3,600	2.12	dry	6.3	recoil

NOTES: n.s. This information not specified by the manufacturer. [a] Shaft has one needle, one bronze and one steady-rest bearing.
[b] Shaft has two needle bearings and one steady-rest bearing. [c] Shaft has two ball bearings and one needle bearing. [d] Housing is heavier at points of stress.
[e] Mower may come with either Clinton VS 2100 or Briggs & Stratton 6B-H engine.

REEL MOWERS Make and Model	Price	Cutting Width	Engine: Make and Model	Cycles	Horsepower at What R.P.M.	Torque (lb.-ft.) at What R.P.M.	Area of Mainshaft Bearings (sq. in.)	Air Cleaner	Muffler Size (cu. in.)
SEARS, ROEBUCK Dunlap 8147	$ 70	18"	Briggs & Stratton 6B-S	4	1.75 @ 3,200	2.85 @ 3,200	1.20	oil	6
WESTERN AUTO Wizard 2X2703	$ 88	18"	Briggs & Stratton 6B-S	4	1.75 @ 3,200	2.85 @ 3,200	1.20	oil	6
MONTGOMERY WARD Contender 8123	$ 90	18"	Briggs & Stratton 6B-S	4	1.75 @ 3,200	2.85 @ 3,200	1.20	oil	6
MOTO-MOWER Winston	$ 90	20"	Briggs & Stratton 5S	4	1.0 @ 3,200	1.65 @ 3,200	1.57	oil	6
GRASS QUEEN 70	$100	18"	Briggs & Stratton 6B-S	4	1.75 @ 3,200	2.85 @ 3,200	1.20	oil	6
REO Scotty	$100	18"	Reo 5240-7	4	2.25 @ 3,800	3.1 @ 3,800	1.78	dry	4.5
CLEMSON Power Drive, Jr.	$110	18"	Briggs & Stratton 6B-S	4	1.75 @ 3,200	2.85 @ 3,200	1.20	oil	15.7
MONTGOMERY WARD Wardmaster 8114	$110	18"	Briggs & Stratton 6B-S	4	1.75 @ 3,200	2.85 @ 3,200	1.20	oil	6
MOTO-MOWER Highlander	$110	18"	Briggs & Stratton 6B-S	4	1.75 @ 3,200	2.85 @ 3,200	1.20	oil	6
EXCELLO 718 R	$115	18"	Briggs & Stratton 6B-S	4	1.75 @ 3,200	2.85 @ 3,200	1.20	oil	6
PENNSYLVANIA Exeter 22118	$115	18"	Briggs & Stratton 6B-S	4	1.75 @ 3,200	2.85 @ 3,200	1.20	oil	15.7
SEARS, ROEBUCK Craftsman 8150	$115	18"	Briggs & Stratton 6B-SF	4	1.75 @ 3,200	2.85 @ 3,200	1.20	oil	6
BOLENS	$120	18"	Briggs & Stratton 6B-S	4	1.75 @ 3,200	2.85 @ 3,200	1.20	oil	6
ECLIPSE Lark	$120	18"	Briggs & Stratton 6B-S	4	1.75 @ 3,200	2.85 @ 3,200	1.20	oil	6
EVERSHARP 50	$120	18"	Briggs & Stratton 6B-S	4	1.75 @ 3,200	2.85 @ 3,200	1.20	oil	6
JACOBSEN Pacer	$120	18"	Jacobsen J-100-AS	2	1.8 @ 3,200	2.6 @ 3,000	a	oil	35.
SAVAGE Power Chief	$120	18"	Briggs & Stratton 6B-S	4	1.75 @ 3,200	2.85 @ 3,200	1.20	oil	6
COOPER Klipper ACA	$125	18"	Briggs & Stratton 6B-S	4	1.75 @ 3,200	2.85 @ 3,200	1.20	oil	6
SEARS, ROEBUCK Craftsman 8154	$125	18"	Briggs & Stratton 6B-S	4	1.75 @ 3,200	2.85 @ 3,200	1.20	oil	6
MOTO-MOWER Sun Valley	$135	18"	Briggs & Stratton 6B-S	4	1.75 @ 3,200	2.85 @ 3,200	1.20	oil	15.7
DUO-TRIM 18 SPL 418	$140	18"	Clinton A2100	4	2.0 @ 3,600	2.9 @ 3,600	1.32	oil	4.5
ECLIPSE Rocket	$140	20"	Briggs & Stratton 6B-S	4	1.75 @ 3,200	2.85 @ 3,200	1.20	oil	6
REO Royale 18	$140	18"	Reo 5200-7	4	2.25 @ 3,800	3.1 @ 3,800	1.78	dry	17.7
TORO Sport Lawn 20"	$140	20"	Briggs & Stratton 6B-S	4	1.75 @ 3,200	2.85 @ 3,200	1.20	oil	15.7
CLEMSON Power Drive	$150	18"	Briggs & Stratton 6S	4	1.6 @ 3,200	2.65 @ 3,200	1.57	oil	6
JACOBSEN Lawn Queen	$159	21"	Jacobsen J-100-B	2	1.8 @ 3,200	2.6 @ 3,000	a	oil	35.

NOTES: n.s. This information not specified by manufacturer. [a] Jacobsen engine shafts have two ball bearings, for which area cannot be specified.

CUTTER						BODY				
Type of Cutter	How Close To Wall Mower Can Trim		Height of Cut		Leaf Mulcher	Housing Material	Wheel Diameter		Wheel Material	Wheel Bearing
	Front	Side	Lowest	Highest			Front	Rear		
edged bar	3/4"	5/8"	1-1/2"	2-1/2"	standard	14 ga. steel	6"	6"	plastic	nylon
edged bar	1-1/2"	1/2"	1"	3"	n.s.	16 ga. steel	7"	7"	plastic	nylon
edged bar	1/2"	n.s.	1"	2-7/8"	optional	1/8" aluminum	6-1/4"	6-1/4"	plastic	none
edged bar	n.s.	3/8"	7/8"	2-7/8"	optional	14 ga. steel	6"	6"	steel	powdered metal
edged bar	n.s.	3/8"	7/8"	2-7/8"	optional	14 ga. steel	6"	6"	steel	powdered metal
edged bar	3/8"	3/8"	1/8"	2"	standard	14 ga. steel	6"	6"	plastic	nylon
edged bar	3"	1/2"	1"	3"	optional	14 ga. steel	7"	7"	steel	powdered iron
edged bar	1-3/8"	1/2"	1-1/4"	3"	standard	14 ga. steel	5"	7"	steel	powdered metal
edged bar	3/4"	5/8"	1-1/2"	2-1/2"	standard	14 ga. steel	6"	6"	plastic	nylon
reversible bar	5/8"	1/2"	7/8"	2-7/8"	standard	14 ga. steel	6"	6"	plastic	nylon
rotor, 2 blades	2"	3/8"	1"	3"	none	14 ga. steel	6"	6"	steel	Oilite
edged bar	3/8"	3/8"	1"	2-1/2"	optional	1/8" aluminum	6"	8"	plastic	nylon
bar and blades	1/2"	3/8"	3/4"	3"	optional	14 ga. steel	6-1/4"	6-1/4"	steel	powdered metal
edged bar	1/2"	1/2"	13/16"	2-3/8"	standard	12 and 14 ga. steel	6"	6"	steel	powdered metal
edged bar	1-3/8"	1/2"	1-1/4"	3"	standard	14 ga. steel	5"	7"	steel	powdered metal
edged bar	1-1/2"	1/2"	1-1/4"	3"	standard	1/8" aluminum[d]	6"	8"	zinc	powdered metal
bar and blades	1/2"	3/8"	3/4"	3"	included	14 ga. steel	7"	7"	steel	powdered metal
edged bar	3/4"	5/8"	1-1/2"	2-1/2"	standard	14 ga. steel	6"	6"	steel	nylon
edged bar	3/4"	5/8"	1-3/16"	3"	standard	3/16" aluminum	7"	8"	steel	nylon
edged bar	1/2"	1/2"	1"	3-1/4"	optional	3/16" aluminum[d]	6"	8"	steel	nylon
edged bar	3/8"	3/8"	1"	2-1/2"	optional	1/8" aluminum	6"	8"	plastic	nylon
bar and blades	2-3/4"	9/16"	1"	3"	optional	14 ga. steel	7"	7"	steel	ball
edged bar	3/8"	3/8"	1/8"	2"	standard	14 ga. steel	6"	8"	plastic	nylon
reversible bar	1/2"	1/4"	7/8"	2-7/8"	standard	3/16" aluminum[d]	6"	8"	steel	nylon
reversible bar	2"	1/4"	7/8"	2-7/8"	standard	3/16" aluminum[d]	6"	8"	plastic	nylon
edged bar	1-1/2"	1/2"	1-1/4"	3"	standard	1/8" aluminum[d]	6"	9"	zinc	powdered metal
edged bar	3/8"	3/8"	1"	3"	optional	1/8" aluminum[d]	6"	8"	steel	powdered metal
edged bar	3-1/2"	1/2"	1-1/2"	3-1/2"	standard	1/8" aluminum	7"	7"	plastic	nylon
edged bar	1/2"	1/2"	1"	3-1/4"	optional	3/16" aluminum[d]	8"	8"	steel	nylon
edged bar	3/8"	3/8"	1"	2-1/2"	optional	1/8" aluminum	6"	8"	plastic	nylon
edged bar	3/8"	3/8"	1"	3"	standard	5/32" aluminum[d]	6"	8"	steel	powdered metal
edged bar	2"	1/2"	1/2"	3"	standard	14 ga. steel	6"	8"	steel	nylon
edged bar	3"	1/2"	1"	3"	optional	14 ga. steel	7"	7"	steel	powdered iron
edged bar	1/2"	1/2"	1"	2-3/4"	standard	14 ga. steel	6"	8"	steel	powdered metal
reinforced bar	5/8"	5/8"	1"	3"	standard	1/8" aluminum	6"	8"	plastic	nylon
edged bar	3"	0"	1-1/2"	3"	optional	3/8" aluminum[d]	6"	6"	steel	ball
rotor, 4 blades	1-1/2"	1/2"	3/4"	2-3/4"	standard	1/10" aluminum[d]	6"	8"	steel	Oilite
edged bar	3/8"	3/8"	1"	3"	optional	1/8" aluminum[d]	6"	8"	steel	powdered metal
edged bar	1-3/4"	1/2"	1"	3"	optional	14 ga. steel	6"	8"	steel	ball
edged bar	3"	1/2"	1"	3"	optional	14 ga. steel	7"	7"	steel	powdered iron
edged bar	n.s.	3/8"	1"	3"	standard	14 ga. steel	7-1/2"	7-1/2"	steel	ball
edged bar	n.s.	3/8"	1"	3"	standard	14 ga. steel	8"	8"	steel	ball
edged bar	2-3/8"	3/4"	1"	3-1/4"	optional	3/16" aluminum	8"	8"	steel	ball
edged bar	1/2"	1/2"	1/2"	3-1/2"	optional	16 ga. steel	6"	16"	steel	ball

CUTTER					PROPELLING MECHANISM				
Starter	Rear-Shaft Bearing	Drive to Rear	Height of Cut		Drive to Wheels	Clutch	Wheel Bearing	Ground Speed (m.p.h.)	
			Lowest	Highest				Slowest	Fastest
rope	ball	open belt	5/8"	2"	open chain	belt tightener	bronze	1-1/4	3
rope	Oilite	open chain	1/2"	3"	open belt	split pulley	Oilite	3	4
recoil	ball	open chain	7/8"	1-7/8"	open belt & chain	belt tightener	sleeve	1-1/2	3
rope	ball	encl. chain	3/4"	1-1/2"	encl. belt & chain	belt tightener	cast iron	1/4	3
recoil	ball	partly encl. chain	5/8"	1-3/4"	partly encl. chain	auto. centrifugal	none	1/4	3
rope	ball	encl. chain	3/4"	2"	partly encl. belt & chain	belt tightener	Oilite	2	3.7
recoil	ball	enclosed gears	7/16"	2"	enclosed gears	friction	roller	1/4	3
recoil	ball	open chain	7/8"	1-7/8"	open belt & chain	centrifugal	sleeve	1-1/2	3
rope	ball	encl. chain	3/4"	1-1/2"	encl. belt & chain	belt tightener	cast iron	1/4	3
recoil	roller	encl. chain	3/4"	1-3/4"	enclosed belt	belt tightener	bronze	n.s.	n.s.
rope	roller	open chain	3/4"	2"	open chain	belt tightener	none	1-1/2	4
recoil	ball	open belt	5/8"	1-5/8"	open belt	belt tightener	roller	2	5
recoil	ball	encl. chain	1/2"	2"	enclosed chain	belt tightener	ball	n.s.	n.s.
recoil	ball	open chain	1/2"	1-1/2"	open chain	belt tightener	none	1	3
recoil	roller	partly encl. chain	5/8"	1-3/4"	partly encl. chain	auto. centrifugal	Oilite	1/4	3
recoil	ball	encl. chain	1/2"	2-1/4"	encl. belt & chain	belt tightener	Oilite	1.7	3.4
recoil	roller	encl. belt	7/8"	1-7/8"	open chain & gear	belt tightener	iron	1	3
recoil	roller	encl. chain	1/2"	2-5/8"	encl. belt & chain	belt tightener	roller	1	4
recoil	ball	encl. chain	3/8"	1-1/2"	enclosed chain	auto-disk type	roller	1.1	3.7
recoil	roller	encl. chain	15/16"	2-3/16"	encl. belt & chain	belt tightener	cast iron	1/4	3
recoil	ball	encl. chain	3/4"	2"	partly encl. belt & chain	belt tightener	Oilite	2-1/4	4
recoil	roller	encl. chain	3/4"	1-1/2"	partly encl. chain	expanding shoe	none	1	3
recoil	ball	encl. chain	3/4"	2"	encl. belt & chain	belt tightener	Oilite	2	3.7
recoil	ball	encl. chain	1/4"	2-1/2"	encl. belt & chain	split pulley	bronze	1/2	3.9
recoil	ball	enclosed gears	7/16"	2"	enclosed gears	friction & jaw	roller	1/4	3
recoil	roller	encl. chain	5/8"	2"	encl. belt & chain	auto-disk type	Oilite	1.7	3.3

Most homeowners prefer the versatile rotary—but

with a mulching attachment, it grinds up leaves so you don't have to rake them. Even without the attachment, it more or less disposes of last year's corn stalks and tomato vines (also small toys, sticks, and hot dogs from bygone barbecues).

Don't think the power reel mower is obsolete, though. It's still the favorite among estate gardeners and greenkeepers. If you have ploughed real money into a fine lawn and want that golf-green look, you'll prefer the reel type. It's advantages are:

- Smooth cut. The reel shears off grass cleanly and evenly. A rotary can, too, but only if it is perfectly adjusted.
- Power drive. All power reel mowers are self-propelled, while only the more expensive rotaries (priced from $100 on up) are.

What size? Well, what size is your yard? A big mower saves work only if you have a large, unbroken expanse of lawn. For a small yard, or even a large one containing flower beds, trees and shrubs, a small mower is better because it is easier to maneuver.

Most people find the 18-inch job adequate. Mowers of approximately this size account for half of all sales (and are the ones listed in our spec chart).

One caution on size, though. Some overzealous promoters of inexpensive rotary mowers advertise the outside diameter of the blade housing and call that the "size." The true size, which is the width of the swath cut, will be an inch less. If you're in doubt, measure the blade.

Which engine? The one thing that every know-it-all expounds about power mowers is that there are two types of engines, two-cycle and four-cycle, and that the two-cycle engine is inferior and hard to start. *This is just plain not so.* A good two-cycle engine performs as well and starts as easily as a good four-cycle engine.

The obvious differences between the two types roughly cancel out. The two-cycle is simpler (three moving parts) and sometimes cheaper. The four-cycle has the appurtenances of auto engines—camshaft, pushrod, etc.—which cost money. The two-cycle requires gas mixed with oil (though you then *do* know that it has oil). The four-cycle burns regular gas, like a car; but then you have to remember to keep the crankcase filled with oil (a messy job, too). Both types make too much noise unless fitted with good mufflers—the unmuffled two-cycle just screams at an annoyingly higher pitch. The two-cycle smokes when it gets out of adjustment, but the four-cycle may do that, too.

So you should look, not for one type or the other, but simply for a good engine suited to the mower it operates. The standards you apply to auto engines apply equally well here. For instance:

- Power output. The bigger the blade the more horsepower and torque you need. Allow extra power for a rotary to be used often on heavy weeds. Also allow extra for a self-propelled rotary.
- Bearings. The money that the manufacturer puts in here pays off in longer engine life. Rotaries need huskier bearings on the main shaft to take the shock that comes when the blade hits a rock. Most one-lung engines have two, plain, solid bearings, which are rated by their effective bearing area. Power Prod-

Watch Your Toes!

No power mower is safe, but the rotary mower has a particular taste for toes—on slopes it wants to roll back over your feet. Dr. William L. White of the University of Pittsburgh checked 19 hospitals around Pittsburgh last year and found that they had treated 89 people injured by rotaries. The accidents broke down so:

- Toes and feet—48 cases;
- Fingers and hands—36 cases;
- Legs—five cases (three struck by blade fragments, one hit by a stone, one clobbered by an overturned mower).

Dr. White estimates that, nationwide, at least 10,000 similar accidents occurred last summer.

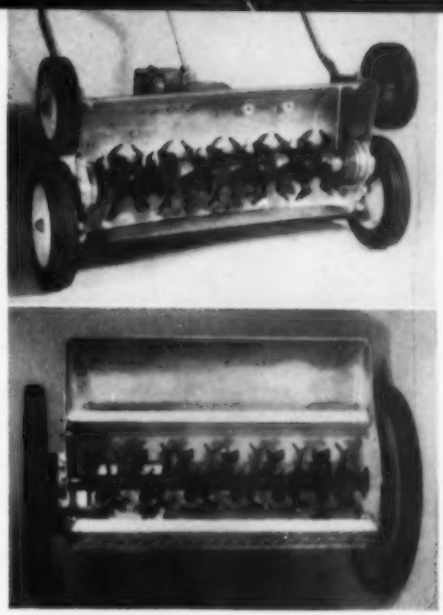
a reel may cut smoother

ucts uses needle bearings; Jacobsen uses needle and ball bearings. For these, area cannot be specified. The same general rule applies to all bearings, though: the more bearings and the bigger they are, the better.

• Air cleaner. Dirt in the carburetor is the most common cause of trouble with mower engines. So the air cleaner is important. The oil-bath type is considered somewhat more effective, though not used on many rotary mowers. Reason: You have to tip rotaries to clean grass clippings out of the housing and the oil may spill.

• Muffler. Some power mowers sound like a B-52 on takeoff. The engine exhaust makes the most but not the only noise—blades (especially rotary ones) scream; housings rattle; transmission parts clank. Still, a good muffler helps a lot. The best clue to silencing ability is size, the number of cubic inches exhaust gases have to expand in. The small mufflers on many engines are little more than the open ends of the exhaust pipes. A few quality mowers have whopping big ones, such as the 57-cubic-inch muffler that Lawn-Boy uses. An under-the-housing exhaust, incidentally, is favored by some experts, who say that the housing itself acts as a silencer.

• Starter. A recoil starter, which automatically rewinds the cord after each pull, is strictly a convenience but adds only a few bucks to the cost of a mower. It's nice, too, if the rewind unit is easy to detach, as it is on some Sears mowers. Then you can use an ordinary rope when the rewind cord breaks—you can be sure it will break on a Saturday afternoon after the service shop has closed.



CROSS BETWEEN ROTARY AND REEL TYPES, the new "hammer-knife" mowers have rotary-like blades spinning on reel-like horizontal shafts. They can cut weeds and mulch leaves, are said to be safer than rotaries. Contour (upper photo) and Mott models are also pictured on PS cover.

Cutter. Here's the part of the machine that does the job at hand, mowing the grass. It varies from make to make in small details that can be significant.

The reel cutter is standardized more than the rotary type. It scissors grass between rotating spiral blades and a stationary bed knife. The more spiral blades there are, the closer the cuts come and the finer the result. Small mowers usually have reels with five blades; the Toro Sportlawn has six blades; and some makes can be ordered with seven.

[Continued on page 264]

There's a dream mower in the future of your lawn

A radically new kind of grass-cutting machine is predicted by one expert, whose firm sells more mowers than any other. His crystal ball reveals these improvements for the future:

• Much smaller, lighter engines that run at higher speeds

• Automobile-type electrical systems—storage battery, generator, self-starter, standard ignition (no magneto)

• Fuel injection, to replace carburetors

• Fluid drives—and eventually full hydraulic power, with the engine driving a pump and individual hydraulic motors turning each wheel. Such a mower could turn around in a space equal to its own wheelbase

You can already see the start of the trend to a new kind of mowing machine in the riding mowers, designed from the ground up for easy grass cutting. **For a special report on mowers built for riding, please turn the page.**

LOW SLUNG, the tricycle-type Toro Pony (left) keeps a secure footing even on grades. A 2.75-hp. engine drives a 27-inch reel independently of the wheels—you can disengage the cutter to ride over gravel. An extra friction clutch reverses the wheels for tight maneuvering.

TWIN-ENGINE JOB (below) has a three-hp. one-lunger (between the lady's legs) to spin the 30-inch blade; another 2½-horse unit (under seat) to drive the rear wheel. Bready Champion also offers gear transmission (two speeds forward, one reverse), foot brake, foot clutch and hand throttle.

TWIN BLADES cut 24-inch swath under streamlined Mow-Cycle (left). It has a three-hp. Clinton engine powering the two close-set rear wheels through a belt-to-gear-to-chain drive train. Seat of steel screening molded into a cushion is said to provide a cool, comfortable ride.

Hop Aboard and Mow Your Lawn

YOU'LL see more and more of a newly evolving breed of power mowers this spring: a machine basically designed to cut grass while you sit on top. The seat is no afterthought, to be attached if you want it, but an integral part of the mower. Some of these machines do nothing but mow the lawn, but most

LIKE A CAR, Porter-Cable's Mark XXVI (above) has front engine, standard geared differential. Two blades cut 26-inch swath, can be stopped quickly by special brake. There is a drawbar hitch at rear for towing some attachments, and dozer blade can be put on front.

CLOSE-TRIMMING REEL CUTTER—the wheels are out of the way behind the cutter—is used on Reo's 25-inch Ride-A-Lawn (above). A lever lifts the cutter off the ground and disengages it to let you drive across walks and driveway. Other attachments can replace the cutter.

ROTARY CUTTER FLOATS on its rear mounts so that it can tilt with front wheels to follow contours of the ground. Cutting unit comes off the machine when other attachments are to be used. Under the hood of the Simplicity Wonder-Boy is an L-head engine delivering 3.6 hp.

take attachments for other yard jobs.

Six of the many models now on the market are shown above. Most makers lean toward a machine resembling a small car: four wheels, automotive-type steering (though the handle is usually a tiller or bicycle bar), big rotary cutter swinging between the wheels. The mowers that use reel-type cutters look more like scooters.

In general, the riding mowers tend to big size (swath of 24″ or more) and big price (from around $200, way up). Yet many mow small lawns—an affluent suburbanite won't walk behind a mower if he can ride on top of one. END

In 1890 . . . 60% of the value of the average home was in the house

Your House Is Now

A new study reveals that the value of your home depends mostly on the building and improvements, not on the land.

By Dexter M. Keezer
Director, Dept. of Economics, McGraw-Hill Pub. Co., Inc.
and William H. Chartener
Economist, McGraw-Hill

THE statistical drawings above tell a story that is important for all Americans, and a story that is particularly important for those millions in cities and suburbs who own their homes or who may own them before long.

They are based on figures presented in a new book, *Capital Formation in Residential Real Estate*, written by Leo Grebler, David M. Blank and Louis Winnick and published by the Princeton University Press for the National Bureau of Economic Research. What the drawings say that is so significant to present and potential urban and suburban homeowners is this: *The land part of your investment in a home is now of minor and steadily decreasing importance. It is what goes into the house in labor, materials, equipment and care that largely determines the value of your investment.*

As the significance of these facts sinks in, the business of owning a home emerges in a new light—as an investment over which the owner has an increasing measure of control, and an investment that is also likely to be cashed in.

Add to this the fact that for most Americans their home is the largest single investment they will ever make, and it conclusively demonstrates the importance of giving their home full respect as an investment as well as a place in which to live.

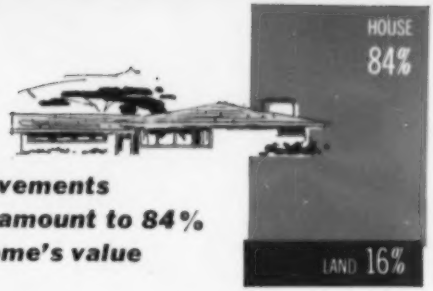
When the fact that the value of the land is a minor and declining part of the investment in a home is added to a few other key facts about home owning, the significance of home ownership tends to emerge in a new light.

One of the key facts involved is that the federal government makes it easy —some people think much too easy—to become a homeowner and to increase the value of your property through improvements and alterations.

Another key fact is that Americans have become such a tribe of 20th-century nomads that there is a steadily mounting chance that those owning homes will sell them, and buy others, rather than die in their present homes.

THE upshot of all this is that you are now largely the master of your fate as homeowner. How you get set up in your house, and fix it up, is by far the controlling element in your investment. And the chance that you will want to cash in on the investment rather than hold it increases all the time.

This was not always the case. So long as the cost of land was a major part of the investment in a house, what the



Now . . . the house and improvements amount to 84% of the average home's value

Your Savings Account

owner could do to improve and protect his investment was limited. In fact, the number of people who crowded in around the house in metropolitan masses, and thus boosted the value of the land, tended to have about as much effect in determining the value of the house as anything the owner could do about the structure.

HENRY GEORGE capitalized on this fact toward the end of the last century to touch off one of the liveliest economic crusades in our national history. He argued that the owners of the land didn't need to do anything to get rich except sit around and wait for people to crowd in and increase its value by making land scarcer and scarcer. He maintained that if the government took all this "unearned increment" in the value of land in taxes, it would need only this "single tax" to pay all its bills. Primarily on this platform, Henry George ran for mayor of New York City in 1886. And he and a lot of other people thought he actually got enough votes to win but was counted out by crooked election tellers.

But since Henry George cut his wide political swath in the U.S., the part of the investment in a home represented by the value of the land—and hence the "unearned increment"—has declined strikingly. Indeed, the authors who dug up the figures on which the drawings for this article are based say they actually understate how much the value of land as a part of the total investment has declined. This is because the only figures they could get for land value include a lot of expenses in fixing up the "raw" land to accommodate a house—such as grading, landscaping and paving.

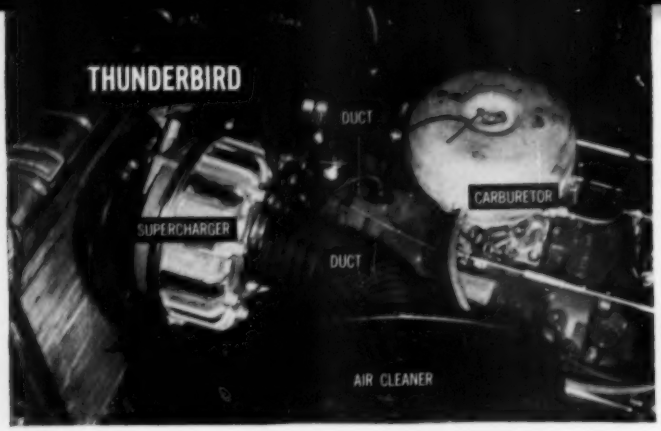
Most of the explanation for this change is found, of course, in the development of modern transportation, particularly automobile transportation. Primarily because of the automobile, what yesterday was a potato field far from the city's center becomes a housing development today. The tightly packed city residential area gives way to suburbia and exurbia. And with the relieving of pressure on scarce city and nearby suburban land, the share of land value in the total value of the home has gone down.

This has meant that the part of the investment in a home over which the owner has some positive control—the part represented by the structure—has increased. At the same time, so has the

[*Continued on page 254*]

Number of Home-Owning Families Goes Up and Up

THREE out of five American families now own their homes, according to a check recently made by the U. S. Bureau of the Census. As recently as 1940 it was only two out of five families. Not counting those living on farms, about 26 million families own their homes, and the number keeps going up every year.



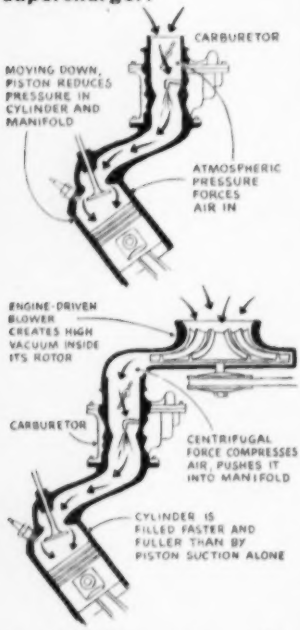
IN A DAYTONA T-BIRD, Ford's modification of the McCulloch blower looked like this. It eliminates the two-speed feature in favor of a fixed-diameter pulley on the supercharger shaft. Dome-covered carburetor is a modified four-barrel Lincoln job. Intake manifold has larger-than-standard passages for fuel-air mix.

Superchargers Spur

Factory-installed blowers are breathing new vigor into power plants of four 1957 cars. It's a counter to fuel injection.

By James C. Jones

What is a supercharger?



DIFFERENCE between conventional and supercharged engines is shown here: The first sucks in its fuel-air mix; the supercharged forces it in by a blower.

A SUPERCHARGER is the auto industry's latest whip to beat more horses out of already highly bred engines. You can now have a "blower" as standard equipment on the 1957 Studebaker Golden Hawk and Packard Clipper. Or Ford will install one as an option on their 312-cubic-inch V-8 and on the Thunderbird.

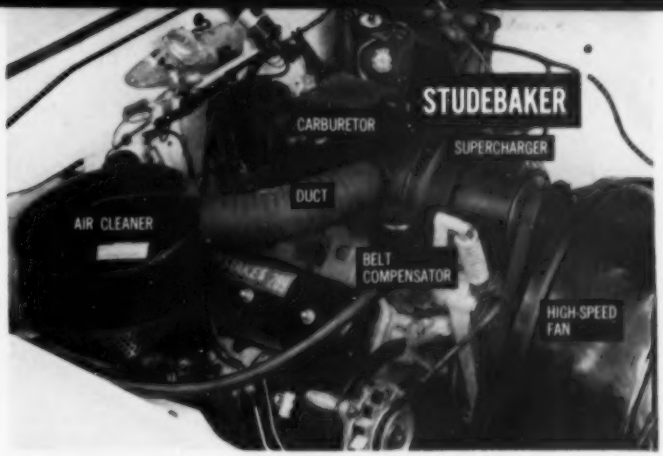
Whether Studebaker-Packard and Ford are front-runners in a trend or simply grasping at competitive straws depends on two things:

1. Whether enough buyers will pay a fat price bonus to get that fat power boost. (The Ford option, for example, adds $447.40 to the bill.)

2. And whether fuel injection will develop into such a strong threat that only a trump like supercharging can match it.

Superchargers are old hat in racing-car circles; they're not even new on production vehicles. Cord had them in 1937, Graham a few years later and Kaiser as recently as 1955. Basically an air compressor, a supercharger rams a mixture of air and fuel into the engine's cylinders, filling them with a much heavier charge than piston suction alone could. Result: more power to move the pistons and, ultimately, the wheels.

The Studebaker-Packard blower is a standard McCulloch unit of the centrifugal type (PS, Dec. '53), with the engine tailored to supercharger requirements. Ford uses a modified McCulloch unit developed over



ENGINE ROOM of Golden Hawk looks like this. Installation of the supercharger required moving the coolant thermostat over near the left cylinder bank. Because this blower has a high-boost, low-boost feature, effective belt length changes with diameter of blower pulley. Spring-loaded idler takes up difference.

Horsepower Race

the past two years in cooperation with Ford engineers.

By modifying the entire air-intake system of its 312-cu.-in. V-8, Ford has increased by 15 to 20 percent the amount of air crammed down the engine's "throat." The intake manifold has been enlarged and valve size increased. A special fuel pump of higher pressure and capacity feeds into a modified Lincoln four-barrel carburetor, sealed and pressurized to prevent spraying.

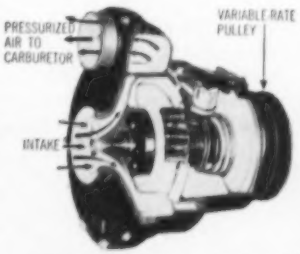
On the supercharged Ford the fuel-filter capacity is triple that of the standard filter. A dual breaker-point distributor is used instead of a single point. The cylinder heads are of special design, and an optional camshaft is available. All other components, including the block, are standard. A fixed pulley turns the supercharger (Studebaker uses a variable-rate pulley). Net effect of these changes is to kick up the normal 245 horsepower of the engine to 300.

On the Golden Hawk the water manifold has been changed so that the thermostat housing, normally upright, lies out of the way on its side. To overcome intake-manifold and carburetor pressure, the fuel pump is pressurized at 5.2 pounds per square inch, which keeps fuel from being forced back into the pump. Special connecting rods and main bearings on the Hawk take the heavier load. The standard Studebaker two-barrel carburetor is used, with altered linkage. Since a wet-type air cleaner might tend to siphon off oil it's not entitled to, a dry air cleaner is employed. The S-P supercharger provides a five-pound pressure boost, delivering far more fuel-and-air mixture into the cylinders than ordinary intake vacuum would.

The Golden Hawk will turn up a true 122 m.p.h. or better, depending on conditions.

[*Continued on page 240*]

SPECIAL JOB, a 1956 Thunderbird owned by Clark Gable, uses a two-speed McCulloch blower. This car accelerates from 0 to 60 in six seconds.



CUTAWAY shows the centrifugal impeller used by Studebaker-Packard. The mechanism governing amount of boost delivered is at right in housing above.

Vacuum Cleaner Now Drills Holes

SOMETHING radically new in vacuum-cleaner attachments is the "Turb-o-Tool" shown at right. When you connect it to the suction hose, you are ready to drill, sand, or polish the car. But who gets to use the vacuum cleaner —is it His or Hers?

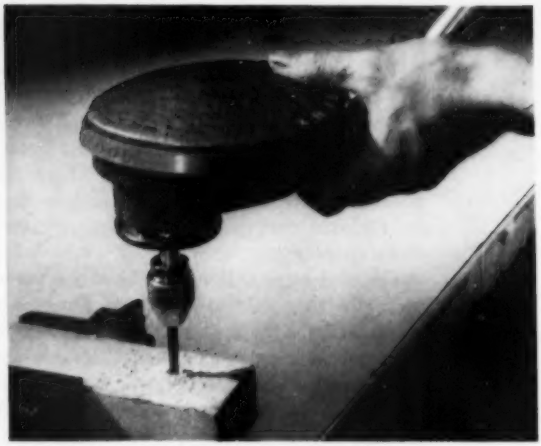
When the man from Electrolux attached the gismo to the hose of a shiny new tank cleaner, and calmly proceeded to drill holes in a block of wood, then quick-changed to disk-sand a table top, we were impressed. Particularly after he twisted off the gismo and vacuumed up the chips and dust he'd made.

The power unit, which weighs about two pounds, consists of a plastic turbine wheel geared to a threaded output shaft. A standard ¼-inch chuck, a rubber sandpapering disk and sandpaper, a lamb's wool buffer and a combination key wrench and screwdriver are included in this basic kit, which sells for about $25.

The floor accessory kit for scrubbing, polishing or buffing may be bought separately for about $15 and includes polishing base, brushes and buffing pad.

Electrolux has beefed up the motor of its latest cleaner with 20 percent more power, but says that the Turb-o-Tool can be used with any of its previous models.—*Herbert O. Johansen.*

The new cleaner is gadgety even when doing



CLEANER'S SUCTION DRILLS A HOLE. This two-pound Turb-o-Tool attachment goes onto the end of the hose to power workshop jobs. The unit will run standard tools fitting a ¼" drill chuck.

POWERFUL SUCTION makes it possible for the vacuum cleaner to operate power tools. In the demonstration below, the machine, at full power, is picking up three half-pound steel balls.

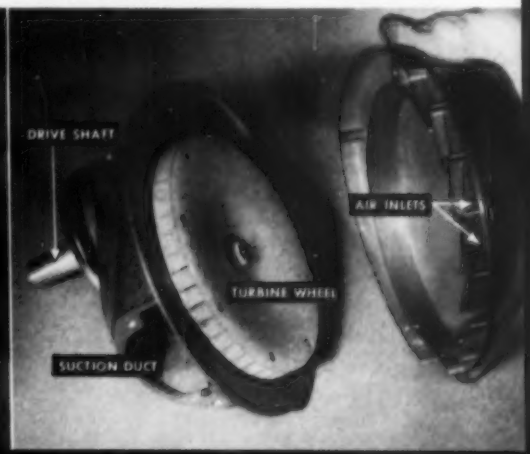
dirt patrol: Cover pops open and automatically stops machine when dust bag needs emptying.

RENEWING LINOLEUM or hardwood floors is another job the turbine unit handles. A snap-on, cast-iron base gives weight to the floor kit's rotary brushes, which scrub, polish and buff.

SANDING DISK GOES TO WORK, with rubber backing pad replacing chuck, and iron base used to add weight. Shaft speed, 2,300 r.p.m. without load, can be reduced by a vacuum valve.

BUFFING BONNET fits over a rubber pad. It's whirled by the turbine unit, too. Different kits supply tool and polisher accessories. Floor brushes come with circular splash guards.

PLASTIC TURBINE WHEEL, operating through a single stage of gearing, spins the output shaft. Since this is an air-suction motor, nothing burns out if the tool stalls. END



Up she goes, with Dick Peck at the controls. On ground, XROE-1 folds into a small package.

One-man copter pins together

LATEST news in helicopters is the "rotorcycle," a one-man flying machine. It can be airdropped for military use as a slender, 12-foot, 250-pound bundle of parts. One man can put it together, mainly by snap pins, and be airborne in 10 minutes. Prediction is that less than four hours of instruction will be needed to learn to fly it.

This first fully collapsible copter is the Hiller XROE-1. Developed for the Navy, it has been built and test-flown by Hiller Helicopters, of Palo Alto, Calif.

The engine is an air-cooled Nelson four-cylinder two-cycle job ordinarily used for powered gliders. Like an outboard motor, it starts with a yank (or yanks) of a pull-cord and burns a mixture of gasoline and oil. It makes a fierce racket.

Marines will use this fancy motor scooter for observation, liaison, escape and small-unit tactical maneuvers. Performance details are secret but its top speed is probably about 60 m.p.h.

Care to buy one? As with helicopters in general, there's only one major obstacle to putting one of them in every big back yard—and it's one you can guess. Until mass demand brings mass production, the price must be prohibitively high. And how can you get the demand for helicopters up till the price comes down?

The Hiller people see no other production obstacle to putting out a rotorcycle at a motorcycle price.

Test pilot for the rotorcycle is Richard L. Peck, a tall, untalkative man who has been persuaded to tell you here what it's like to fly this aerial scooter.—*Darrell Huff.*

How You Fly the One-Man Copter

By Richard L. Peck
Test Pilot, Hiller Helicopters

SLING one leg over the saddle of the rotorcycle, just as if you're climbing onto a bike. It's no trick. Your feet still touch the ground.

Strap yourself in good and tight. It's going to feel kind of insecure up there with not much around you but fresh air.

Put your feet on those pedals. They're the rudder control.

Take a good look at the dials sticking up between your feet. Those two are your whole instrument panel, all you have to watch. One is temperature, to warn you if the engine's overheating. The other tells r.p.m. That's the one to watch. Keep the needle within those two marked lines all the time you're in flight. You have a leeway of only 200 r.p.m.

I'll start her up for you. You can't reach the pull-rope from your seat.

I give it a yank—just as in starting an outboard or a garden tractor. Oops! Well, it usually takes two or three tries.

That does it! Can you still hear me?

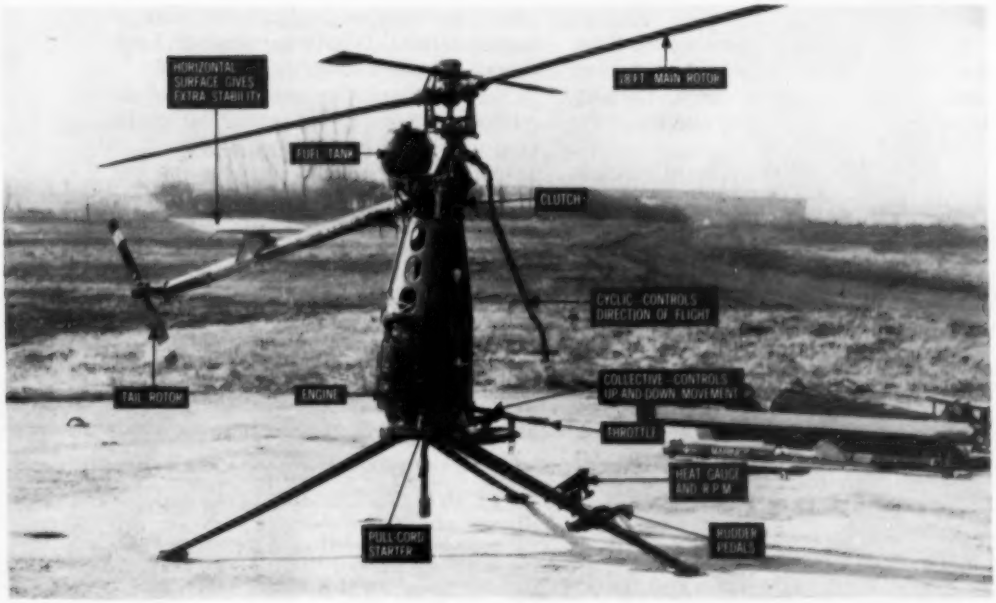
Okay. Take hold of the collective, the lever alongside your left hip. That controls the up-and-down movement by changing the pitch of the main rotors overhead. The handgrip on it is the throttle.

The throttle is similar to the one on a motorcycle. But since the lever comes from behind you, it works the opposite way. Twist it left to give her gas.

Okay. You're ready to take off.

Raise the collective and twist the throttle at the same time. That way you increase the power and the bite of the rotors together. Keep doing it, and keep on watching the r.p.m. so the needle stays in the marked zone.

You're off the ground now, and I'll



ROTORCYCLE BOOM ATTACHMENT: Ease of disassembling the Marines' one-man flying machine is shown by typical joint, in which simple snap-out pins are used to connect components.

bet you hardly knew it. Go on up a way. Keep throttle and collective coordinated now. That's the hardest part.

Now move forward. That's it. Use your right hand to push ahead on the cyclic, the lever that comes down in front of your face. Don't be surprised that you and the copter are leaning forward. That's what helicopters do when they go ahead.

Now slow up and hover. That's it. Pull the cyclic gently back.

Pull it a little farther. See, now you're backing up.

Get some forward speed again. Easy, now. A mile a minute seems pretty fast when you're hanging from nothing, doesn't it? Slow down a bit and try a turn to the left.

That's it. Move the cyclic to the left. You're skidding, because you didn't use the rudder. Give it some left rudder. That's better.

Straighten out. Pretty wobbly? You're overcontrolling—just as you probably did when you learned to drive a car.

Actually, what's fooling you is the lag. You moved the cyclic to the left. Nothing happened right away, so you moved it again a bit more violently. By the time both those motions caught up with you, you were 'way too far over. Keep your control movements gentle and give them time to take effect.

Let's lose some altitude. Move the collective down just a little and reduce throttle as you do it. Always coordinate throttle and collective, and watch that r.p.m. indicator.

You've discovered by now one odd thing about the rotorcycle, compared with a fixed-wing job or even another helicopter. There's no wall or panel or anything like that in front of you to tell you whether or not you're flying on an even keel.

That's all there is to flying a rotorcycle. Control up-and-down by raising or lowering the collective, twisting the throttle at the same time to keep the r.p.m. close to constant. Control direction of progress by moving the cyclic the way you want to go. And use the rudder on turns.

Now let's try an experiment. Lift the collective without twisting the throttle. Your rotor blades are taking too much bite now for the power you're giving them. The r.p.m. is dropping—and so are you.

Give it more gas and build up the r.p.m. Now you're steady again.

But what happens if the engine dies on you? Then you must put the collective to full down position fast, to keep the r.p.m. within limits.

Try it. Throttle the engine back to idle. Now you've duplicated a case of engine failure. What's happening? Look down. Are you falling?

No. You have the same control of direction as before, by using the cyclic control right there in front of you.

Let her glide down. You can put her where you want her, just as if you were using power.

You're going to hit the ground too hard for comfort, though. Just before you sit her down, pull up hard on the collective.

Do it just right and you land as softly as a feather—whether the engine's running or not. That's the nice thing about any helicopter, even Bitsy here. END

NEXT MONTH: The story of the extraordinary plane that had already set two records before Lindbergh flew it to Paris 30 years ago. Read "Lindbergh's Amazing Airplane" in May PS.

Don't Believe These Tall Tales About Rattlesnakes

They have fooled too many folks too long. An expert explodes them here for you.

By Laurence M. Klauber
Consulting Curator of Reptiles, San Diego Zoo

QUEER and unexpected effects of rattlesnake venom on man and animals have often been reported; some of these have been so fantastic as to border on the miraculous. Equally strange are some of the recorded results of venom on plants or inanimate objects, and some of these have been so often repeated as to become true folk tales.

One of the oldest is the ax-head story, first told, I believe, by Cotton Mather in 1714. In this, a rattlesnake strikes the metal bit of an ax. The metal changes color and, when the ax is used again, the discolored edge breaks off. The ax tale is the only one known to

Many a whopper has been told about the length of a rattler.

me in which rattlesnake venom affects metal, but there are many stories of its effects on plants and wood. In one of the oldest of these yarns, a hoe handle is struck by a rattlesnake and within an hour has swelled to such an extraordinary extent that it pops out of the eye of the hoe.

Another old and controversial myth relates to the supposed power of a rattlesnake to charm its prey. Briefly, it is the belief that rattlesnakes have the power of so charming, fascinating or hypnotizing prey that it makes no effort to escape, and even moves helplessly toward its doom. In its most acute form,

No rattler is as obliging as this.

the myth recounts how a rattler at the foot of a tree has only to fix a baleful eye on its prospective victims aloft, whereupon birds come fluttering down, or squirrels descend helplessly, and deliberately walk into the snake's open mouth.

Occasionally, carnivals or snake shows, to stimulate the apprehensive curiosity of the customers, state that attendants will be on hand to lead out anyone who may be overcome by carelessly exchanging stares with a rattlesnake.

At zoos, there have been no observations on captive rattlesnakes with prey that verify any theory of fascination. Birds and small mammals placed in cages with rattlesnakes, as soon as they have become used to their new surroundings, pay no attention whatever to their reptilian cage mates. They run about, nestle against or perch on the snakes; and, as far as rats and mice are concerned, if not supplied with food, they will frequently eat the heads, tails or rattles of the snakes. It is true that occasionally a hungry snake will strike one of the animals and kill and eat it; but unless this occurs, the animals evince no fear. It cannot be supposed that behavior patterns in the wild could be so different that snakes, which regularly fascinate or charm their prey there, would never show the slightest ability to do so in captivity.

Another belief is that snakes can milk cows. This is an extremely ancient and widespread myth, and is told of many different kinds of snakes, occasionally including rattlers. Milk is not a natural food of these reptiles, and stories of their fondness for it are imaginary.

Another myth, widespread throughout the West, is to the effect that it is unnecessary to aim carefully when shooting a rattler, since the snake will automatically line up his head with the barrel of the gun and the first bullet will inevitably find its mark. An even less possible variant maintains that a rattler will strike at and hit the oncoming bullet.

The derivation of this myth, I think, lies in the fact that one ordinarily shoots a rattler at a much closer range than almost any other object. The aim therefore is generally good, although I can

Editor's Note: *Laurence M. Klauber, who gathered these myths, is probably the leading U.S. authority on rattlesnakes. He has recently completed two fat volumes on rattlers' "habits, life histories and influence on mankind." The books, published by the University of California Press are based on "first-hand experiences with more than 12,000 rattlers in the field and laboratory." Mr. Klauber included a chapter on "Myths, Folklore and Tall Tales." The accompanying article consists of passages chosen from that chapter.*

testify that it is quite easy to miss a rattler even at close range, especially with a derisive audience on the sidelines.

At any rate, a simple experiment will prove that an angry rattler in his striking coil does not automatically line up with the weapon, as the following notes from my diary show:

"June 7, 1945: This morning I tried the gun-barrel experiment on several rattlers with absolutely negative results. Both a 20-gauge shotgun and a .410 pistol were used. I had two large western diamonds, a Great Basin rattler and a sidewinder. Also a red diamond, but he can't be counted as he wouldn't assume a fighting pose. It was a bright, sunny day. The snakes showed, by facing a person and assuming a defensive coil, that they could see movement readily enough. They were tried with the guns close and distant (from a few inches to several feet). In no case was there any tendency of a snake's head to follow the barrel. When the gun was aimed so that it would just miss the head, the snake would not move the slight distance required to get in line, although it was looking at the gun barrel and it would have had to move its head only an inch or two, laterally, to line up with the barrel. With the breech open it was easy to watch the rattler through and along the barrel to determine just where a shot would strike."

Rattlesnake lengths are usually exag-

A rattler's bite does not affect metal.

A rattler's gaze is not hypnotic.

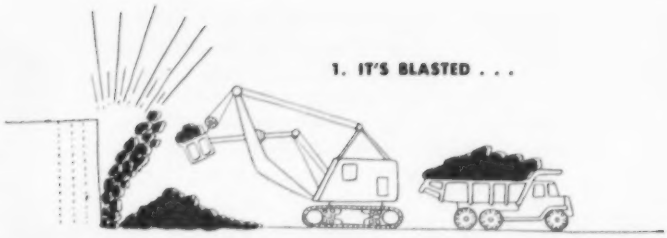
gerated; in addition, some measurements are based on dried skins, which can be stretched up to half again as long as their original possessors. Thus we hear of eight- and nine-foot rattlers in Florida and Texas, where a seven-foot snake would be quite exceptional. But although a nine-foot snake is at least a possibility, some of the stories heard about large rattlers enter the realm of the fantastic and are to be considered myths. I should say that rattlesnakes ought to be placed in the mythical category at 10 feet, thus allowing for some exaggeration.

A myth of wide distribution, particularly in the Missouri Basin states, is to the effect that rattlesnakes and bull snakes have crossed, producing a particularly dangerous hybrid offspring having all the venom of a rattler but with the speed and energy of a bull snake, and, of course, without the identifying rattles. Actually, there is not the slightest ground for this idea.

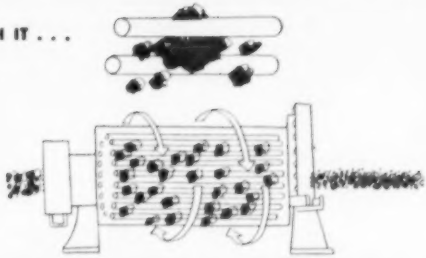
Many of the early accounts of rattlesnakes dwelt at length on their offensive odor, particularly when congregated at their dens. It was most often likened to the smell of cucumbers, and was said to be perceptible at a great distance. This idea is still widely prevalent, but, as a matter of fact, rattlesnakes are virtually odorless, even when there are a number together.

An ancient legend, which has crossed

[*Continued on page 242*]



SYNCHRONIZED BLASTS rip ledge. Chunks of ore go into huge 45-ton trucks specially lined to resist abrasion.



ROD MILLS get into act, grinding the chunks of ore to coarse sand.

WITH A ROAR like a cannon, a "JPM" starts boring seven-inch blasting holes in rock too hard for drills to pierce. Tough taconite is fractured into chips by alternately heating it white-hot with a jet flame, then spraying it with cold water.

How They Tamed the

As America's famous iron mines run low, new machines tackle a tough, ugly ore called taconite.

By Edward D. Fales Jr.

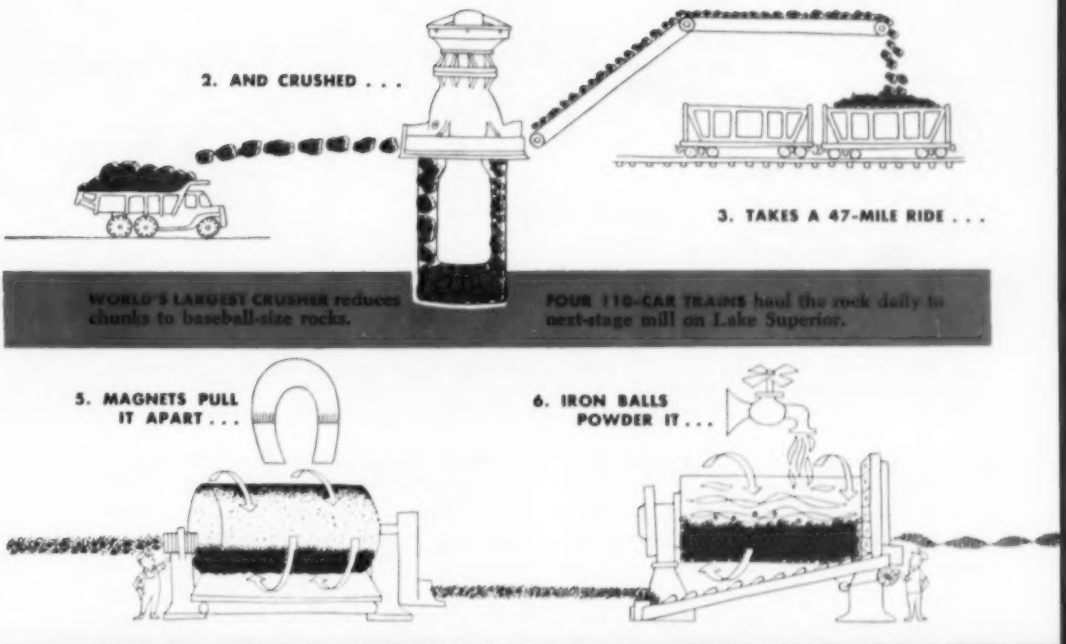
IRON-ORE men call taconite the meanest, toughest rock on earth. It chews up tools, laughs at drills, grinds the teeth off power shovels in eight hours flat. When you haul it, its jostling razor edges (nearly as hard as diamonds) saw bottoms out of ordinary freight cars.

Yet this angry black rock, which is loaded with rich iron ore, at last has been lassoed and tamed.

This month, the first ore ships of 1957 will come whistling down the Great Lakes. One in eight will be loaded with the strangest-looking ore that ever came into Cleveland or Toledo or Chicago. When the hatches are opened millions of little black marbles will come out bouncing and clattering—taconite for our hungry blast furnaces.

The first shipload came down from Minnesota a year ago. This year nearly 4,000,000 tons will go into steel for your car and many other uses.

This great "river" of taconite has begun flowing just in time. The iron ore that put muscle in America is petering out. This is the dusty-red, easy-to-get Mesabi ore that builds our cars, washing machines, railroads, skyscrapers; that supplies our guns and tanks—and won the last war. Your own family's safety and



World's 'Meanest' Rock

comfort—even your pay check—have been largely based on Mesabi ore.

After World War II, steel men took a startled look at what the Arsenal of Democracy had taken from the Mesabi pits. "Suddenly," says one, "the barrel's bottom was showing."

And so America began to import ore—from Africa, South America, Labrador. We built steel plants on the East Coast, to be near the ships. This was fine, but . . . suppose war comes again? Our foreign ore might be cut off.

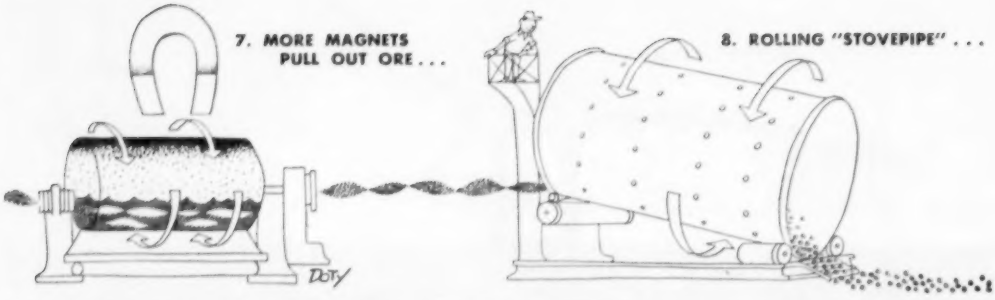
Steel men turned in sheer desperation to taconite—the cussword of the Mesabi range.

The Mesabi range zigzags like a 100-mile lightning strike across northern Minnesota. In mid-range, like raisins on a cake, are surface pits of red ore, easy to shovel and ship. These are the pits that are petering out.

At the lightning strike's east end, in a forest wilderness, are flinty outcroppings. These are the taconite ledges.

For years taconite was believed to be impossible to mine. But when the Reserve Mining Co. was formed recently (by Republic Steel and Armco Steel) its goal was to blast iron out of these ledges. Engineers knew it had to be done.

First problem was drilling. In a quarter-hour, with the strongest steel drill, you can go *three inches* down in taconite. Then you throw your drill bit away. It's had it. And three inches is nothing. Blasters needed holes at least 18 feet deep—thousands of them—that could be



MAGNETS AGAIN: They lift out a ton of rich dust for every ton of waste "tailings."

RICH, MOIST ORE is now too fine for furnaces, so it must be "snowballed" in rolling drums.

quickly bored into the ore for blasting.

Linde Air Products Co., which sells oxygen, offered to tackle the problem. Using an old Indian stunt (heat a rock, then chill it) Linde engineers designed a special oxygen drill called a JPM—"jet piercing machine." It spits a high-velocity stream of oxygen and kerosene straight down at the taconite bed. Suddenly, with a thud like a five-inch gun, the stream ignites into a 4,700°F. jet flame. The taconite glows white-hot. Then a cold water jet leaps at the blistering rock.

This punishment "spalls" tough taconite into millions of chips that are spewed from the hole by steam. In an hour the JPM goes down 40 feet and leaves a hole seven inches wide.

With enough JPMs the engineers felt they could do a job. So steel men sank a heavy investment ($600,000,000) into two plants.

Plant No. 1, at Babbitt, Minn., 47 miles inland in woods teeming with bear, uses some of the world's largest machines to smash taconite and bring it to heel.

What will you die of? Mortality tables chart the grim hazards of today's world. Read Popular Science for May.

Plant No. 2 is at Silver Bay, a new harbor on Lake Superior. This is where the crushed rock is brought so precious iron ore can be taken from it and formed into billions of marbles ("pellets").

Sounds like cannon fire roar today from the 1½-billion-ton ore beds as the JPMs boom and scream. Now and then you hear a roaring *whoo-oosh!* and a whole cliff collapses.

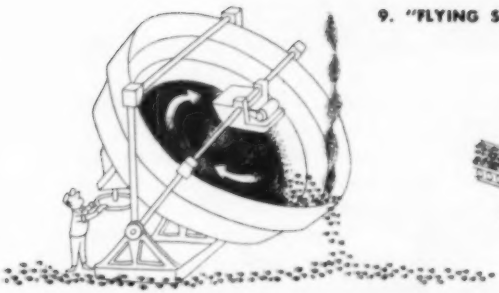
The JPMs drill whole rows of blast holes. These are fired in fast sequence—like the cylinders in your car. The rock wall disintegrates in a neat pile.

To smash the chunks (some are as big as your piano) engineers dug a dizzy cavern, deep as a 15-story building, in nearby granite. Into this they sank the world's largest crusher, a bell-shaped chunk of steel that weighed 1¼ million pounds. Taconite chunks fall between this "bell" and its casing. Then two 500-hp. motors start running.

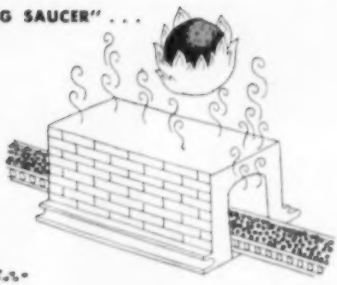
These are geared to barely stir the bell—a slight ⅜ of an inch—on its axis. But that is enough. The bell grunts a little, and chunks spill out—nutcrackered to baseball size in 40 seconds.

If this is hard on the taconite, it's also hard on the gyro-torque crusher. So bell and pit have liners of alloy steel, which are replaced every 30 days. Even with this, when taconite is poured in, it's never allowed to hit the bell. Its sharp edges, which easily cut glass, would chew the bell away. And so taconite almost always falls on taconite.

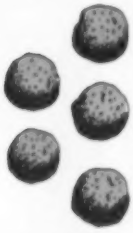
Core of the bell is a shaft 26 by 2½ feet, one of the largest forgings ever made. Two spares are kept handy. "If all should break," says an engineer, "it would take seven months to forge one."



9. "FLYING SAUCER" . . .



10. IT COMES OUT BAKED



ANOTHER WAY to "snowball" fine ore is in "saucers." The balls come out coated with coal.

OVEN burns off coal dust, giving hard-coated ore marbles ready for the steel furnace.

After meeting its master in the primary crusher, the taconite spills into two smaller crushers. Then it rides back to the surface on the world's strongest conveyor belt, a steel-cable-reinforced job that works under tension of 120,000 pounds.

Now the taconite takes a 47-mile ride over a brand-new railroad to Silver Bay. Here other mills seize the "tough guy" of rocks, and hammer him down still more to size. Heavy iron rods flail the chunks down to a sand. A barrage of steel balls beats it to a powder finer than talcum. But the rock is still fighting back. So great is the abrasion that *90 tons of new steel has to be shipped into the plant every day* to replace parts chewed out by taconite.

But eventually taconite defeats itself. Being magnetic, it can be washed over magnets that pull out the loosened grains of ore. Here, however, the engineers hit another snag.

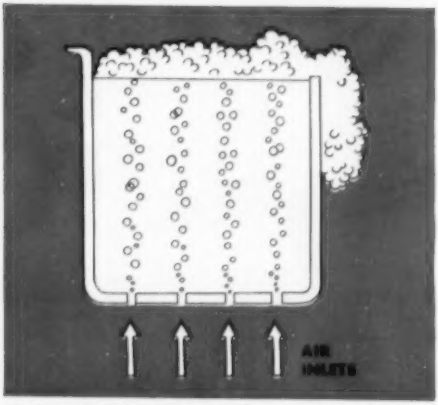
"The waste, pure sand, is so fine," an engineer said, "that if we stacked it up it would blow all over Minnesota." And so the mountains of waste, 20,000 tons every day, are flushed far down the sloping bottom of Lake Superior, to a hole that luckily is 900 feet deep.

The ore now freed from the taconite

CRUSHER'S OPEN MAW—30 feet across—is shown here, ready to swallow huge chunks of taconite. Steel liner plates, battered and torn by razor-edged rock, are chewed away in 30 days.

WHIRLING SAUCER AT WORK: Crushed and moist, ore is belt-fed into this spinning steel dish. Here it "snowballs" itself into marble-sized pellets, ready for oven (see top of page).

When the bruising ends, ores haven't a speck of fight left



"BEER SUDS" METHOD of separation is used with nonmagnetic jasperite. Powdered rock falls into oleic acid solution; iron-bearing ore floats over top with "suds"; tailings remain.

could never be used in a blast furnace. A furnace inhales four tons of air for every ton of iron it makes. In the resulting hurricane, fine taconite ore would blow right out the stacks.

But at the University of Minnesota one day, Prof. E. W. Davis made a discovery. If he moistened a handful of the tiny grains and rolled them downhill they "snowballed" into marbles ¾ inch in diameter. Here was the answer.

So in the Reserve plants the ore falls into revolving "stovepipes." As it rolls up one side it falls back in moist, black marbles. These are mixed with coal dust and cooked. When the coal burns away, the marbles are as strong as if molded at a pressure of 15 tons per square inch. Taconite is getting its muscle back again!

These pellets not only stand up well in shipment but make excellent ore charges for blast furnaces.

As shiploads of taconite move south toward the steel mills today they're joined by ships bringing still another new "pelletized" ore from the north. In nearby Michigan, ore men have tapped a rich cousin to taconite, "jasperite." Jasperite is milder stuff than taconite. Its ore is not black magnetite but brownish hematite. Being nonmagnetic, a different, "beer-suds," process is required to extract this type ore.

The jasperite, powdered, falls into vats of water and oleic acid (one of the fatty acids). As air bubbles up through the vats, each bubble lassoes particles of iron-bearing powder to which the oleic acid likes to cling. These bubbles form suds that overflow—like suds off a beer glass. The suds are collected and the iron ore extracted.

The jasperite ore is rolled into balls, too. But instead of rolling in drums, it is belt-fed into whirling steel dishes called "flying saucers." Oddly enough, the dishes are patterned after old noodle-making machines used in Hungarian kitchens.

At the furnaces, both jasperite and taconite marbles are mixed with red Mesabi ore. But the new ores are richer than the Mesabi ore (64 percent pure iron as compared with 50 percent). Result: four blast furnaces loaded with taconite or jasperite alone could turn out as much iron as five furnaces charged with Mesabi.

NO END OF TROUBLE

Many troubles beset the men who built the two taconite plants in the Minnesota wilderness—one of the greatest engineering jobs ever attempted.

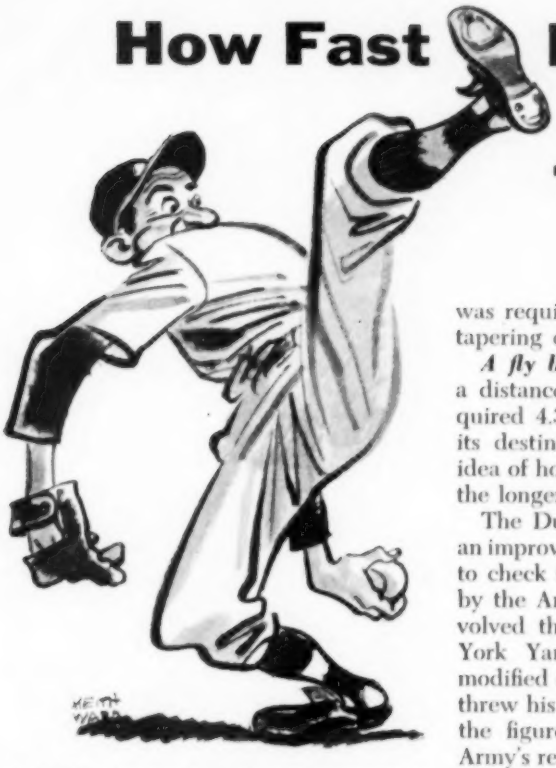
"I knew this job was going to be different," one engineer said, "the day the bears began knocking down our transits."

Thus taconite and jasperite (plus foreign ores) are taking the strain off our Mesabi reserves. Much of the latter now can be saved for emergencies.

But meanwhile the steel men hold another card up their sleeves.

The nine-mile long taconite beds, they are beginning to suspect, may be only the "lip" of an underground bed. Some geologists think that Lake Superior itself may be only a pool of cold water lying in a huge "dish" of taconite. But even without tapping this "dish," we have enough taconite to last generations! END

How Fast Does a Baseball Travel?



SOME years ago, U. S. Army scientists devised a machine with which to measure accurately the velocities of small moving bodies, including baseballs.

When the Army made its measurements, Mark Koenig was playing second base for the New York Yankees. A ball thrown by him just as fast as he knew how to throw it was clocked at a speed of 127 m.p.h., or about the top speed of a modern eight-cylinder automobile. The ball was thrown over a distance of 60 feet, six inches.

At the time the Army ran its speed tests, Bob Feller of the Cleveland Indians was in his prime and was widely known as a speed pitcher with a very fast ball. However, his fastest ball was clocked at only 98.6 m.p.h. This was nearly 30 m.p.h. under the speed of the ball thrown by Koenig. The difference in velocity was accounted for by the increased distance over which Bob Feller was required to throw the ball. A sharp tapering off in speed resulted.

A fly ball struck to the outfield over a distance of 98 yards, or 294 feet, required 4.3 seconds [47 m.p.h.] to reach its destination. This will provide some idea of how rapidly speed tapers off over the longer distances.

The DuMont Company recently used an improved electronic device with which to check the figures compiled years ago by the Army. One of the tests made involved the famous pitcher of the New York Yankees, Bob Turley. Using a modified oscillograph, past which Turley threw his fastest pitch, it was found that the figure recorded checked with the Army's results. Turley was found to pitch at the rate of 94.2 m.p.h., or four miles under the top speed made by Bob Feller when he was in his early twenties.

Years ago, when golfer Gene Sarazen was at the peak of his fame, the speed of a ball struck by him in a drive was accurately measured. It turned out to be less than the speed of the baseball thrown by Mark Koenig. The golf ball was clocked at 176 feet per second, which amounted to the rather modest speed, comparatively, of 120 m.p.h.

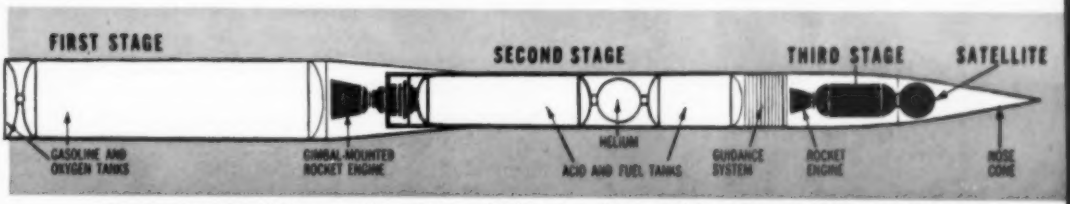
A struck golf ball is not only beaten by a well-thrown baseball (Koenig's) but also (and this *is* surprising) by a well-hit tennis ball.

Years ago when Bill Tilden, the great champion, was in his prime (1931), his powerful service accounted for tennis-ball speeds up to 151 m.p.h., or 31 m.p.h. faster than the golf ball teed off by Gene Sarazen.—*Raymond F. Yates, in "Faster and Faster"; Harper & Bros.*

X-3
GIMBAL MOUNTED ROCKET ENGINE
HELIUM TO PRES-SURIZE FUEL

3 Mighty Engines to Launch Satellites

Upon three rocket motors hangs the success of the ship of adventure that may put man-made moons in the sky.



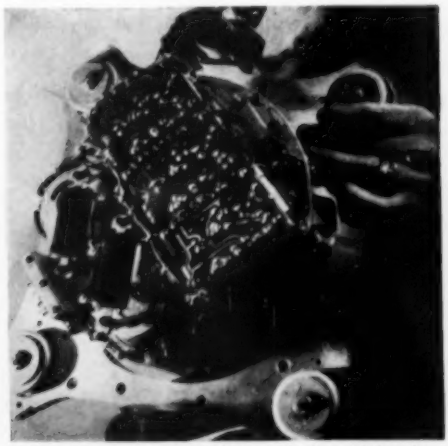
CUTAWAY VIEW of Vanguard launching vehicle shows its three stages and their rocket engines.

In photo at left, GE technicians install X405 first-stage motor for trial in rocket test pit.

By Alden P. Armagnac

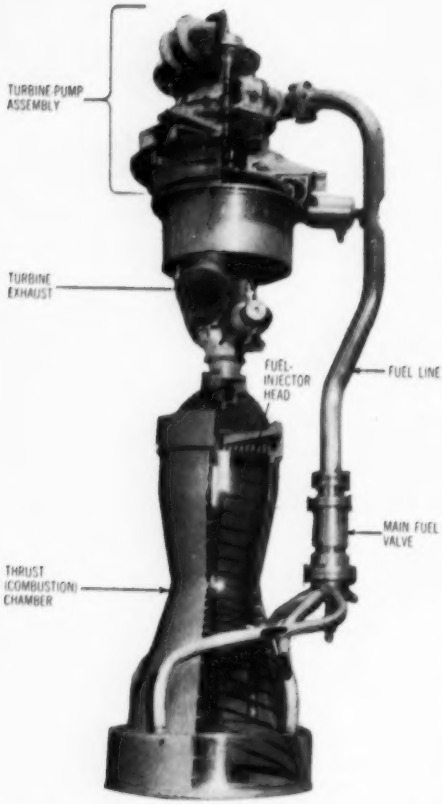
WITHIN a few months, a 72-foot rocket vehicle will blast off from Patrick Air Force Base in Florida. Closing the switch that fires it will be the final human act involved in sending up the earth's first artificial satellite —a 20-inch globe of shiny magnesium alloy tucked within the vehicle's nose.

From there on, the fate of man's pioneer attempt to launch a space craft will depend on three mighty rocket motors, and their automatic control system. In 10 drama-packed minutes, if all goes well, the fiery engines will propel the Vanguard launching vehicle to 300-mile altitude, and impart the necessary 18,000-m.p.h. speed to the satellite to sustain it there in an earth-circling orbit. This



ROBOT CAPTAIN of satellite vehicle will be this electronic automaton, preset to carry out control-handling program. It will steer the Vanguard craft on correct course with aid of built-in gyros.

FROM BLOCKHOUSE, observer watches GE's X405 engine put through paces in test pit at Malta, N. Y. This motor will ram the 72-foot ship through virtually all of the atmosphere.



CUTAWAY MODEL of a GE experimental rocket engine, reportedly similar to X405, is believed to show latter's principle. Since X405 is a military development, its details are secret.

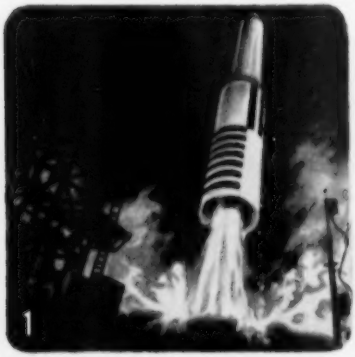
is the part each power plant will play:

The first-stage engine, in the 2½ minutes before it's spent and jettisoned, gives the vehicle 36-mile altitude and 4,000-m.p.h. speed. In bulldozer fashion, by brute 27,000-pound force, this General Electric X405 gasoline-and-liquid-oxygen rocket motor rams the missile through more than 99 percent of the atmosphere. Sleek and finless though the Martin-built launching vehicle is, it bucks so much air resistance that its pointed tip may glow red-hot.

Next, the second-stage engine ignites. Developed by Aerojet-General, it burns a liquid hydrazine-family fuel, with fuming nitric acid as an oxidizer. While firing, it boosts the vehicle to 130-mile altitude and 11,000-m.p.h. speed. The big missile then coasts to full 300-mile altitude. Its course, vertical at first, has flattened and by now should be precisely horizontal.

Streaking cometlike from the spent second stage, the vehicle's third stage literally carries the ball—the now-uncovered satellite, mounted at its nose. In miniature, this seven-foot-long rocket forecasts future spaceships, dispensing with streamlining to ply airless voids. A solid-fuel rocket engine of one of two competing designs—being developed by the Grand Central Rocket Co. and by the Allegheny Ballistics Laboratory of

Moon-launching program packs 10 fateful minutes with drama



FROM MOMENT OF TAKEOFF, flame-spouting Vanguard launching vehicle will be on its own, roaring aloft under preset automatic control (1). Above 36-mile altitude and past more than 99 percent of earth's air, it jettisons its spent first stage and also its streamline nose cone, which may be glowing red-hot from speedy passage through atmosphere (2). At 300-mile-

the Hercules Powder Co.—accelerates it to the required orbital speed of 18,000 m.p.h. Now a satellite itself, the rocket releases and launches the metal "moon," which it may nudge ahead with a spring.

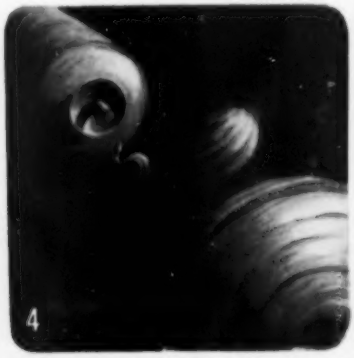
Latest plans add a picturesque sequel. Besides the costly instrumented satellite, the third stage may launch a "Woolworth satellite" of equal or larger size—a self-inflating plastic balloon, coated with aluminum foil, and trailing its more elegant companion as a tag-along moon.

A robot captain commands the Vanguard launching vehicle during ascent. This Minneapolis-Honeywell automaton contains gyros that sense and correct any deviation from the prescribed course. For steering, it actuates a mechanism that tilts the rocket motors of first and second stages in their gimbal mountings. Thus the 11-ton vehicle keeps itself upright, in vertical ascent, much like a baseball bat juggled on a fingertip.

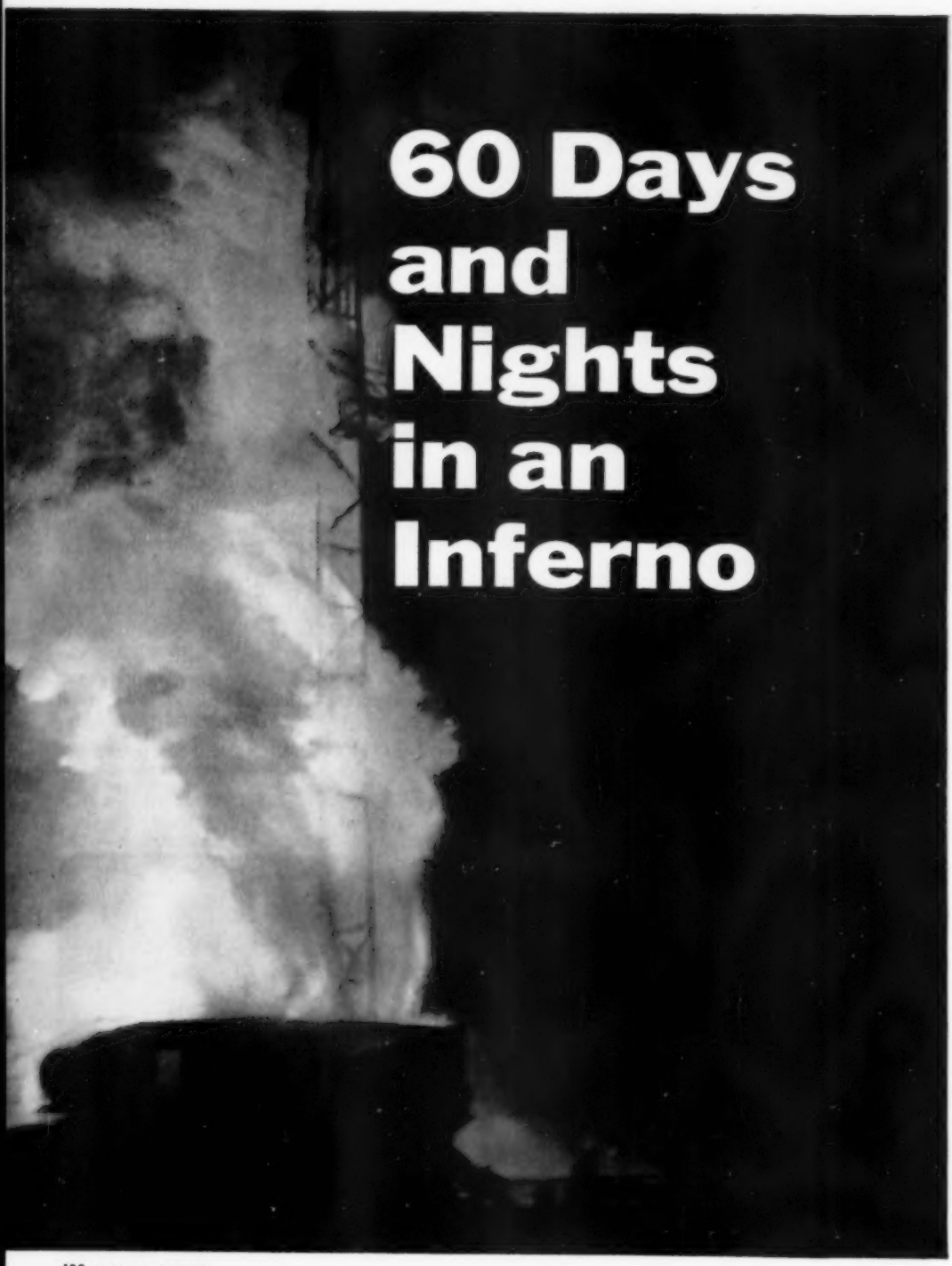
By gradually changing the gyro setting, the robot alters the course from vertical to horizontal. It checks unwanted rolling by turning auxiliary jets on and off. In the same way it sets the second stage spinning, to stabilize it, just before the third stage separates. Beyond that point, the ship of adventure is fully committed and no further control can be applied.

Six satellite-launching attempts, with as many Vanguard vehicles, are scheduled before next year's end. Some may fail—for the bold project, barely within reach of today's technology, allows virtually no margin for error, and every smallest valve and tube and relay must work perfectly. Scientists will consider Project Vanguard a success if, as they hope, a half-dozen tries yield them even one or two "good" satellites. END

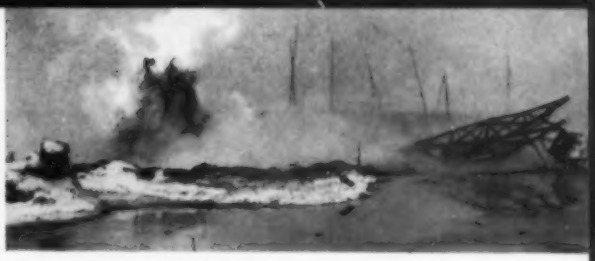
THREE-STAGE VANGUARD ROCKET will be tallest, fastest, highest-flying—though less bulky and heavy than some of biggest war-type rockets, as shown above by comparison to scale.



high top of climb, second stage levels off, spins for stability, and releases third stage (3) for final speed dash to 18,000 m.p.h. and launching of metal-ball satellite (4). In addition, in at least some of the six satellite-launching attempts being planned, third stage may launch a plastic-balloon moon that inflates itself (5) from a tiny cartridge of compressed gas.



60 Days and Nights in an Inferno



WITHIN HOURS after the Akuinu well blew and caught fire, the whole rig had collapsed, and melting muskeg and underground water had formed a boiling, steaming caldron. The photograph on the facing page was taken just after the fire broke out.

When the sub-Arctic's wildest oil-well fire set the frozen earth ablaze, the roughnecks roasted and shivered for two solid months before they finally got it licked.

By Gardner Soule

"A WILD well," oil men have been saying for years, "is nature on the loose." You know what comes next: A story that proves the point.

This year the boys have a new tale that proves it all over again: They light their cigars, and they tell you about the wildest well in Canada's history, and how it blew, and how it caused the meanest fire in Canada's history, and how the best oil firefighters in the business shook their heads, gave up, and walked away.

And how, after two months of struggle, roughnecks put out the fire, which had roasted them while Canada's winter froze them, and how, after the fire, the men escaped just before ground they were walking on turned to oatmeal and water and would have sucked them down.

7:55 a.m., Jan. 16, 1956

"I was in my trailer, 200 feet from the well, when I heard it," says Earl Clark, 33. "A terrific noise like a rifle crack, a jillion times louder. Away she went!"

Akuinu River No. 13-36—a wildcat in the lonesome muskeg wilderness of northern Alberta, near Lesser Slave Lake—had blown wild and caught fire.

Clark, a hazel-eyed former corporal in the Royal Canadian Air Force, knows the story as well as any man alive. He was the geologist on what (everyone thought) was an ordinary wildcat well where oil might, or might not, be found.

"What had happened," he explains, "was this: We were drilling, night and day, and had reached a depth of 2,720 feet. Just before dawn, without warning, we ran into high-pressure gas. The gas roared out at what, we figured later, was 15 million cubic feet a day—a surprisingly high rate. The jet stream of gas smashed floodlights, and this probably was what set the gas ablaze.

"From then on, the din was terrific. Even when we stood 100 feet from the blaze we had to yell at each other."

The racket, Clark well knew, was the least of the problems the 13 men at Akuinu had on their hands. But he had no idea how many and how fearsome those problems would be. Not many oil men have ever seen, let alone fought, a well as wild as Akuinu 13-36 was to prove itself.

8:00 a.m., Jan. 16

Problem: What about the man last seen at the mouth of the well? Wild wells, oil men tell you, hurl heavy machinery as world champ Parry O'Brien tosses the shot, and spew out 30-foot lengths of pipe as a fizz bottle squirts shaving cream, and have turned hundreds of strong men into cripples and killed hundreds of others.

This, for Earl Clark, was a problem that had a happy answer: For Reuben Stromquist, beneath the derrick (the steel lattice tower over the well) had miraculously escaped injury. Stromquist, who had been directing the bit as it dug the well, wasn't even scratched.

8:03 a.m., Jan. 16

Problem: Could the men cut off the

Aerial view shows road around crater. At one time, gas burst out at right of water tanks.

Roughnecks running drill pipe into relief well worked at temperatures around 30 below zero.

The gas blow died as water filled up porous sand of the gas zone in vicinity of wild well.

jet stream of gas, seal it back into the earth? Solution: Roughneck Paul Weiss and the others jumped to stop the gas flow with the blowout preventer.

A massive thing, the preventer operates by a hydraulic pump to cut off any gas coming up between the pipe in a well and the surface casing (a second coat of steel that surrounds the pipe). First thing the boys had to overcome was frigidity: The thermometer read minus 30, and metal is perverse at that temperature. They applied hot steam to the blowout preventer, got it working.

Seconds later, the heat of the fire struck them in their faces. "It was warm in there," Weiss recalls. The heat boiled the men; then melted ice, snow and mud and bathed them in the resulting slush. But they did stop the gas—then, dripping in the slush, clothes freezing to their skins, they looked for, and quickly found, the next headache.

8:15 a.m., Jan. 16

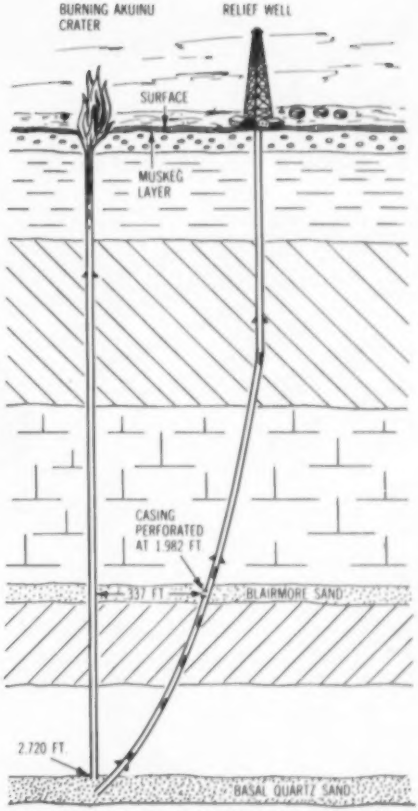
Problem: The wooden housing around the derrick floor had caught fire. Solution: extinguishers.

With these, the lads—they were all typical oil-field workers, age 18 to 30, built like football tackles—put out the housing fire, or almost put it out, by 8:30. All was quiet for half an hour—the only quiet 30 minutes for two months.

9 a.m. to 5 p.m., Jan. 16

The lull was interrupted, and the boys were dismayed, by the sound of gas hissing up again—this time through a mudpit beside the well, where the blowout preventer couldn't possibly cut it off. Suddenly gas exploded again. A blazing well can spray fire over the whole countryside. This one did. It burned down every building on the 10-acre Akuinu lease except the boiler house and Clark's trailer.

Then the worst thing happened that can happen to a wild well: It cratered, dug a hole 125 feet long, 60 feet deep. Now escaping gas could find its way to new outlets within the crater and start new fires.



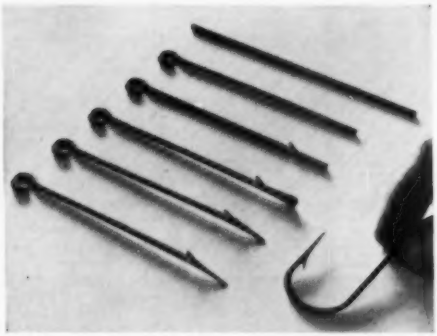
HOW FIRE WAS FINALLY QUENCHED: First theory was that gas flow that caused blowout was coming from basal quartz at a depth of 2,720 feet. Relief well was drilled to reach the original well at this level. When water flooding here failed to stop flow, relief well was plugged back and the casing perforated at Blairmore sand level. This sand proved to be the source of trouble. Although well bores were 337 feet apart at this point, 185,000 barrels of water stopped the gas flow, and the fire finally went out.

This happened. But first the crater became a lake. The fire melted ice and snow and mud. It melted muskeg, a moss-covered bog that turns to water and mush when warm. Muskeg is seven feet deep in the Akuinu region and, because of it, oil wells can only be drilled there in winter, when it is frozen solid. The crater filled with water.

Then, as new bursts of gas came belching through earth and water, there were flaming, 30-foot-high hurricane waves

[*Continued on page 244*]

How They Make Fish Hooks



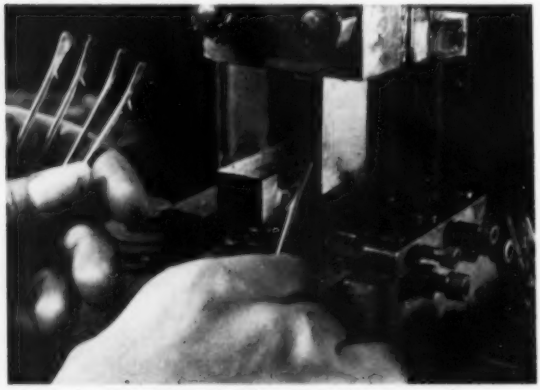
BIGGEST problem with fish hooks, besides rust, is getting the right temper. Make them hard enough to hold a long-lasting sharp point and withstand bending, and they're liable to break at the barb. Make them soft so the barb won't break, and the point will soon lose its sharpness and can be bent easily.

One man who seems to have mastered the ticklish business of heat-treating fish hooks is Fred Miller of San Francisco who, with only five employees, will turn out 1,500,000 fish hooks this year—all smooth and precisely bent, with dagger-like points. "The kind that fishermen like to feel with their thumb and forefinger," says Miller.

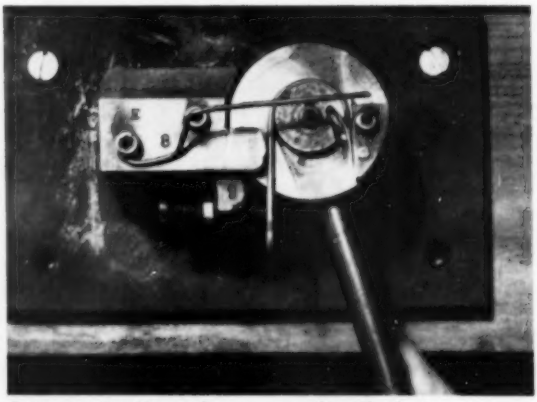
Instead of steel, he uses a special alloy of rustproof nickel wire called Duranickel, 93.7 percent nickel with traces of copper, manganese, aluminum and iron. Fishermen can throw these hooks into their tackle boxes at the end of a day without bothering to dry them off.

Miller makes hooks of all sizes and lengths, from marlin and albacore grapplers to dainty trout hooks for stream sportsmen. He gets orders for as many as 150,000 at a time, from places that are as far away as the Philippine Islands. —*Hal Roth.*

1 RAW MATERIAL: Wire for the fish hooks comes to Miller's plant in paper-wrapped coils that weigh from 350 to 400 pounds. It runs from .045" to .131", costs about $1.65 a pound.



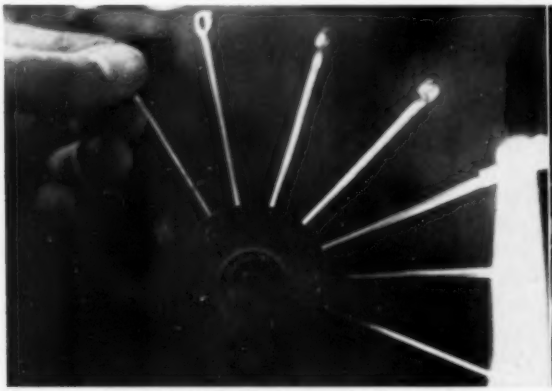
4 FOUR-TON PRESS punches out the points after the hook ends have been forged. The point, curved at this stage, will be checked with a jig to make sure that it's just right.



7 HOOK IS BENT to shape over a die. The barb fits into a notch and the wire is rolled around the die, which revolves clockwise. This is a speedy operation: 1,000 hooks an hour.

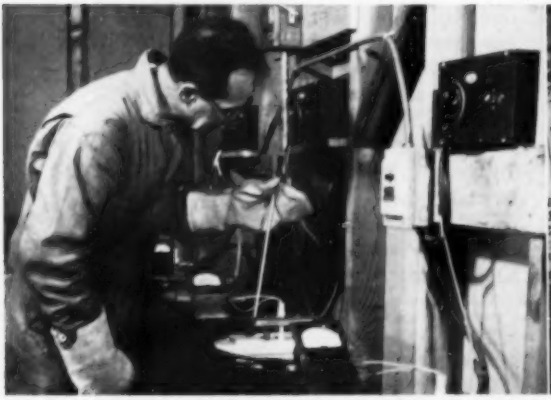
2 AFTER WIRE IS UNCOILED, cut to length, and the eyes bent, each hook is run through this four-ton stamp press, which notches out the barb. Operator can process 300 hooks an hour.

3 FLAT FOR THE HOLLOW-GROUND POINT is forged in a 30-ton punch press. If the hook were merely sharpened, not flattened and hollow-ground, the point would soon be gone.

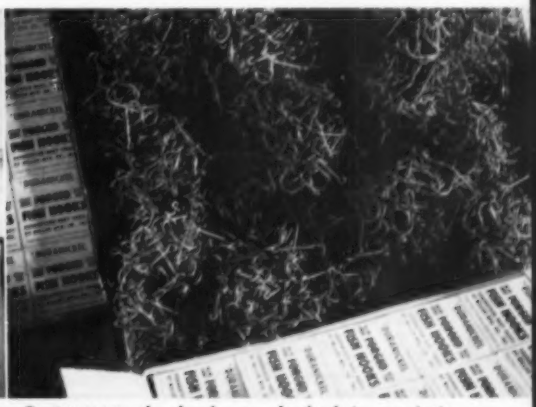


5 PINWHEEL SETUP anneals the hook eyes so they'll stand opening and closing later. Inserted (left), they ride through the flame and drop out into a bucket of cooling water.

6 FINISH-GRINDING and polishing are done on this high-speed emery belt—six of which are used up every day. Before points get here, they are rough-ground on an abrasive wheel.



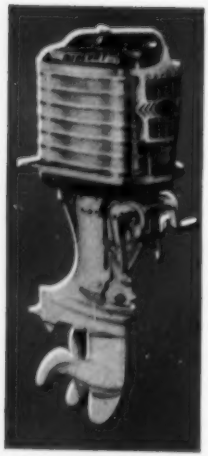
8 HEAT-TREATING takes place after all forming operations have been completed. Here Fred Miller checks the temperature of a batch of hooks ready to come out of the ovens.



9 FINALLY, the hooks are bathed in muriatic acid to remove the scale, tumbled to make them bright, and packaged by weight—approximately 100 hooks to the box. END

New Outboards:

Taking out after their auto big brothers, the 1957 models are competing both in horsepower and flashy looks. But there's also some ingenious engineering under the bright-colored housings.



Mercury packs 60 hp. into big Mark 75.

THE horsepower race is on with outboards, too. Johnson and Evinrude have upped their top 1957 engines from 30 to 35 hp. and their next-in-line models from 15 to 18 hp. Scott-Atwater has boosted its biggest mill from 33 to 40 hp. Leading the pack is Mercury. Last year, when most manufacturers were content with 30 hp., Mercury was turning out a 40-hp. four. This year, Mercury introduced a 60-hp. six, the largest outboard ever produced in this country for pleasure use and by a major company. (Riley, a small West Coast outfit, used to make a 75-hp. unit; during the last World War and for a short time afterward, Evinrude turned out a 50.)

Another entry in the big-engine class is the four-cylinder Fageol 44, introduced in the middle of last season. A four-cycle job, this is sold as a regular outboard, as a V-drive inboard, and as a vertical inboard-outboard combination. In the latter form the motor is inboard, driving an outboard-type power unit via bevel gears. Fageol claims that an owner can convert his craft into an inboard with just a bit, brace and screwdriver.

Except for Mercury's whopper, most of this year's power boost has come from jazzing up earlier engine blocks. Displacement was raised on the Johnsons and Evinrudes, and Scott-Atwater got its extra horses primarily by using a different wheel, letting r.p.m. go to 5,000, instead of 4,200, at the rated horsepower.

Horsepower hassle. For years the Outboard Boating Club of America, which attests to power outputs of products of member companies, rated motors at 4,000 r.p.m., or even less. Since in use most mills were allowed to rev up a good deal faster, power claims were generally conservative. In the 1940s, the Kiekhaefer Company (maker of Mercury) was breaking into the field, and underrated its engines more than anyone else. Word soon got around that a 10-hp. Merc, for example, would outrun a 10-hp. anything 10 days for Sunday. Some companies kicked, but there was nothing they could do because Kiekhaefer calmly

Johnson's generator lights your boat.

Words you'll be hearing more: "Pull over to the side!"

THE water isn't going to be cop-free much longer. Every year more localities are passing legislation to control water traffic. Several states, including New Hampshire, New Jersey, New York and Pennsylvania, already require licenses for boats operated above tidal waters—the tidal waters themselves are under Federal jurisdiction. On the basis of testimony and recommendations heard at its extended hearings, Congress is ex-

High Power, High Style

Scott-Atwater offers choice of colors.

By David R. Lindsay

stayed out of reach—out of the O.B.C., that is. There was nothing more or less scientific about Mercury's figures; the difference was simply in the speed at which the output was measured. The American Power Boat Association, principal race sponsor, has long recognized the slipperiness of horsepower ratings; A.P.B.A. defines its classes by displacement instead.

Anyway, O.B.C. has relaxed its r.p.m. rules. As the specification table on pages 136-137 shows, many motors are now rated at 4,500 or even 5,000. Mercury, still not in O.B.C., rates its engines at 5,800, their recommended top for ordinary service. (In racing, of course, they're wound up a lot more; one racing driver says he's seen Mercs revved above 10,000.)

Evinrude's costliest is electric Lark.

Racing mills. Kiekhaefer is the only big company today turning out stock competition motors. It has the Mark 30 H (29.7 cu. in.) in the 30-inch Class C and the Mark 55 H (39.6 cu. in.) in the 40-inch Class D. The only other stock racing engine on the market is the Champion Hot Rod (19.94 cu. in.), raced in 20-inch Class B. (As a very rough translation factor, estimate one horse per cubic inch.) The new Mercury giant has a displacement of 59.4 cubic inches; a competition version could be raced in Class F (60 cu. in.). Racing is simply a matter of prestige for Kiekhaefer and Champion; too few competition motors are sold to make much of a market. There are less than 4,500 registered stock outboard racers out of some 5.5 million outboard boats and motors.

All motor and a mile high. The new high-standing Merc is called the Mark 75, although the name has no more meaning than the jet-propelled tags given new cars. Without a single sand-casting, the big baby is a triumph of the art of die-casting, which has resulted in great weight savings in almost all outboards. A vertical, in-line six, the Mark 75 has three carburetors and two separate ignition systems. It has a reverse but no shift, which calls for a unique ignition setup.

Unlike the magneto spark used on most outboards, this one has a battery-coil-distributor arrangement, as in an auto. There is a separate coil and condenser for each set of three cylinders, although a single rotor running past two sets of points does the distributing. The

pected to pass a new Federal licensing or boating-control law this spring. Witnesses at the hearings had many things to complain of. These included: speeding in crowded waters, operating boats through or near swimming areas, drivers of ski-tow boats watching their water skiers instead of where they were going, and hot-rodding in general. Many lakes, of course, have had horsepower limits of their own, but the situation is now considered so dangerous by many officials that they want a really strict set of rules for waters being used by motor boats.

generator is a brushless alternator, which charges the battery through a rectifier that converts the AC into DC.

This giant outboard has only a single remote-control handle besides the steering wheel. The handle controls both throttle and distributor, which are interconnected. A button on the handle's end runs the 12-volt electric starter.

To start going forward, you put the lever in the forward position and push the button. The engine is in gear as it begins firing, but it idles at a low 400 r.p.m., equivalent to under one m.p.h.,

1957 OUTBOARD SPECS

MAKE	MODEL	HORSEPOWER (at r.p.m.)	NO. OF CYLS.	BORE & STROKE (inches)	DISPLACEMENT (cubic inches)	REVERSE (lever or gearshift)	STARTING (manual or electric)	FUEL TANK CAPACITY (gallons)	FUEL TANK TYPE (integral or remote)	ENGINE WEIGHT (pounds)	PRICE
BUCCANEER	3-hp. Deluxe	3 @ 4,000	1	2-1/8 x 1-1/2	5.32	piv.	man.	1/2	int.	32	$135.00
	5-hp. Standard	5 @ 4,000	2	2-15/16 x 1-1/2	8.84	piv.	man.	4/5	int.	46.5	$182.50
	5-hp. Deluxe	5 @ 4,000	2	2-15/16 x 1-1/2	8.84	gear.	man.	4/5	int.	52	$215.00
	12-hp. Standard	12 @ 4,000	2	2-1/4 x 2-1/4	17.89	gear.	man.	2	int.	69.5	$325.00
	12 hp. Deluxe	12 @ 4,000	2	2-1/4 x 2-1/4	17.89	gear.	man.	6	rem.	77.5	$360.00
	12-hp. Electric	12 @ 4,000	2	2-1/4 x 2-1/4	17.89	gear.	elec.	6	rem.	86.5	$440.00
	25-hp. Deluxe	25 @ 4,000	2	2-7/8 x 2-3/4	35.7	gear.	man.	6	rem.	119.5	$465.00
	25-hp. Electric	25 @ 4,000	2	2-7/8 x 2-3/4	35.7	gear.	elec.	6	rem.	130	$555.00
CHAMPION	2N Guide Four	4.2 @ 4,300	1	2-1/16 x 1-3/4	5.84	piv.	man.	1-1/4	int.	42	$179.00
	3N-S Guide Six	6 @ 4,300	2	1-7/8 x 1-3/4	9.66	gear.	man.	1-1/4	int.	46	$233.00
	4N-D Superior "7"	7.8 @ 4,300	2	1-7/8 x 1-3/4	9.66	gear.	man.	3-1/2	int.	46	$265.00
	6N-D Sweet "16"	16.5 @ 4,300	2	2-1/2 x 2-1/32	19.94	gear.	man.	6	rem.	54	$387.00
	6N-MS Mid-Ship	(same engine as above but fitted for entirely remote control)									$376.00
	6N-HR Hot-Rod	not available	2	2-1/2 x 2-1/32	19.94	none	man.	2	rem.	46	$450.00
CONTINENTAL	Sport	2.5 @ 3,750	1	1-5/8 x 1-5/8	5.05	piv.	man.	5/8	int.	22	$ 79.95 $ 69.95 as kit
ELGIN	5822 A	2 @ 4,000	1	1-3/4 x 1-9/16	3.76	piv.	man.	7/8	int.	28	$ 98.95
	5952	5.5 @ 4,000	2	2 x 1-11/16	10.60	gear.	man.	4-1/2	rem.	56	$204.95
	5972	7.5 @ 4,000	2	2-1/8 x 1-11/16	11.97	gear.	man.	4-1/2	rem.	56	$219.95
	5894	12 @ 4,000	2	2-3/8 x 2	17.72	gear.	man.	6	rem.	61	$289.95
	5942	30 @ 4,200	2	3 x 2-23/32	38.26	gear.	man.	6	rem.	118	$419.95
	5962	30 @ 4,200	2	3 x 2-23/32	38.26	gear.	elec.	6	rem.	128	$464.95
	5980	30 @ 4,200	2	3 x 2-23/32	38.26	gear.	elec.	6	rem.	130	$489.95
ELTO	3	3 @ 4,000	1	2-1/8 x 1-1/2	5.32	piv.	man.	2/5	int.	30	$145.00
	5	5 @ 4,000	2	1-15/16 x 1-1/2	8.84	gear.	man.	3/4	int.	52	$230.00
	12	12 @ 4,000	2	2-1/4 x 2-1/4	17.89	gear.	man.	5	rem.	75	$382.00
	25	25 @ 4,000	2	2-7/8 x 2-3/4	35.7	gear.	man.	5	rem.	119	$495.00
	25 Electric	25 @ 4,000	2	2-7/8 x 2-3/4	35.7	gear.	elec.	5	rem.	129	$595.00
EVINRUDE	Lightwin	3 @ 4,000	2	1-9/16 x 1-3/8	5.28	piv.	man.	7/10	int.	33	$155.00
	Fisherman	5.5 @ 4,000	2	1-15/16 x 1-1/2	8.84	gear.	man.	4-1/2	rem.	56	$230.00
	Fleetwin	7.5 @ 4,000	2	2-1/8 x 1-3/4	12.4	gear.	man.	4-1/2	rem.	59	$260.00
	Sportwin	10 @ 4,000	2	2-3/8 x 1-7/8	16.6	gear.	man.	6	rem.	74	$340.00
	Fastwin Standard	18 @ 4,500	2	2-1/2 x 2-1/4	22.0	gear.	man.	6	rem.	80	$395.00
	Fastwin Electric	18 @ 4,500	2	2-1/2 x 2-1/4	22.0	gear.	elec.	6	rem.	87	$475.00
	Big Twin Standard	35 @ 4,500	2	3-1/16 x 2-3/4	40.5	gear.	man.	6	rem.	123	$495.00
	Big Twin Electric	35 @ 4,500	2	3-1/16 x 2-3/4	40.5	gear.	elec.	6	rem.	129	$585.00
	Lark Electric	35 @ 4,500	2	3-1/16 x 2-3/4	40.5	gear.	elec.	6	rem.	132	$625.00
FAGEOL	Fageol 44 (4-cycle)	35 @ 5,200	4	2-1/2 x 2-1/4	44.0	gear.	elec.	6-1/2	rem.	190	$825.00
FIRESTONE	3.6-hp.	3.6 @ 4,000	1	2-1/8 x 1-3/4	6.21	piv.	man.	1	int.	36	$119.95
	5-hp.	5 @ 4,200	2	1-11/16 x 1-11/16	7.48	gear.	man.	3-1/2	rem.	42	$215.00
	10-hp.	10 @ 4,200	2	2-11/64 x 2	14.82	gear.	man.	6	rem.	59	$320.00
	16-hp.	16 @ 4,200	2	2-11/32 x 2-5/16	19.95	gear.	man.	6	rem.	68	$362.00
	35-hp.	35 @ 4,800	2	3-1/16 x 2-3/4	40.51	gear.	man.	6	rem.	117	$469.95
	35-hp.	35 @ 4,800	2	3-1/16 x 2-3/4	40.51	gear.	elec.	6	rem.	127	$559.95
JOHNSON	Sea-Horse 3	3 @ 4,000	2	1-9/16 x 1-3/8	5.28	piv.	man.	.7	int.	33.25	$155.00
	Sea-Horse 5-1/2	5.5 @ 4,000	2	1-15/16 x 1-1/2	8.84	gear.	man.	4-1/2	rem.	56	$230.00
	Sea-Horse 7-1/2	7.5 @ 4,000	2	2-1/8 x 1-3/4	12.4	gear.	man.	4-1/2	rem.	59	$260.00
	Sea-Horse 10	10 @ 4,000	2	2-3/8 x 1-7/8	16.6	gear.	man.	6	rem.	72.5	$340.00
	Sea-Horse 18	18 @ 4,500	2	2-1/2 x 2-1/4	22.0	gear.	man.	6	rem.	77	$395.00
	Sea-Horse 18	18 @ 4,500	2	2-1/2 x 2-1/4	22.0	gear.	elec.	6	rem.	87	$475.00
	Sea-Horse 35	35 @ 4,500	2	3-1/16 x 2-3/4	40.5	gear.	man.	6	rem.	123	$495.00
	Sea-Horse 35	35 @ 4,500	2	3-1/16 x 2-3/4	40.5	gear.	elec.	6	rem.	134	$585.00
	Golden Javelin	35 @ 4,500	2	3-1/16 x 2-3/4	40.5	gear.	elec.	6	rem.	136	$625.00
MAJESTIC	M-2N Fisherman Spec.	4.2 @ 4,300	1	2-1/16 x 1-3/4	5.84	piv.	man.	1-1/4	int.	42	$179.00
	M-3N-GS	6 @ 4,300	2	1-7/8 x 1-3/4	9.66	gear.	man.	1-1/4	int.	46	$233.00
	M-4N-GS	7.8 @ 4,300	2	1-7/8 x 1-3/4	9.66	gear.	man.	3-1/2	int.	47	$249.00
	M-6N-GS	15 @ 4,300	2	2-1/2 x 2-1/32	19.94	gear.	man.	6	rem.	54	$355.00

Outboard game of Who's Who

In the table on this and the next page are listed 19 brand names, but there are by no means 19 manufacturers left in the industry. Johnson and Evinrude, whose motors are made in different plants but to the same basic designs and specifications (except for decoration), are both part of Outboard Marine Corp. So are Gale, Elto (the Canadian subsidiary), Sea-Bee and Sea King. These last four brands are all basically alike. Champion, a relatively small outfit, makes Majestic and Voyager motors; Scott-Atwater makes Firestone; Mercury makes Wizard; and

the manufacturer says. To accelerate, you push the handle ahead. This advances the spark (by turning the distributor) until the optimum position is reached. Subsequent additional speed comes from the throttle alone.

Dead and revived for reverse. To go astern you move the handle back to off, which stops the engine entirely. Then you pull it back still further and push the button to start in reverse. Like most two-cycle engines, the Mark 75 can be run in either rotation. Pulling back on the control turns the distributor to the

MAKE	MODEL	HORSEPOWER (at r.p.m.)	NO. OF CYLS.	BORE & STROKE (inches)	DISPLACEMENT (cubic inches)	REVERSE (pivot or gearshift)	STARTING (manual or electric)	FUEL TANK CAPACITY (gallons)	FUEL TANK TYPE (integral or remote)	ENGINE WEIGHT (pounds)	PRICE
MERCURY	Mark 6	5.9 @ 5,000	2	1-3/4 x 1-1/2	7.2	piv.	man.	3-1/4	rem.	42	$229.50
	Mark 10 Trol-Twin	10 @ 5,000	2	2-11/32 x 2-1/8	18.5	gear.	man.	6	rem.	66	$350.00
	Mark 25	20 @ 5,800	2	2-7/16 x 2-1/8	19.8	gear.	man.	6	rem.	75	$401.00
	Mark 25E	20 @ 5,800	2	2-7/16 x 2-1/8	19.8	gear.	elec.	6	rem.	85	$490.95
	Mark 30	30 @ 5,800	2	2-7/64 x 2-1/8	29.7	gear.	man.	6	rem.	110	$485.50
	Mark 30 E	30 @ 5,800	2	2-7/64 x 2-1/8	29.7	gear.	elec.	6	rem.	118	$610.50
	Mark 30 H	30 @ 5,800	2	2-7/64 x 2-1/8	29.7	none	man.	6	rem.	not avail.	$550.00
	Mark 55	40 @ 5,800	4	2-7/16 x 2-1/8	39.6	gear.	man.	6	rem.	111	$652.00
	Mark 55 E	40 @ 5,800	4	2-7/16 x 2-1/8	39.6	gear.	elec.	6	rem.	120	$757.00
	Mark 55 H	40 @ 5,800	4	2-7/16 x 2-1/8	39.6	none	man.	6	rem.	not avail.	$650.00
	Mark 75	60 @ 5,800	6	2-7/16 x 2-1/8	59.4	single control	elec.	6	rem.	168	$982.00
	Mark 75 H	60 @ 5,800	6	2-7/16 x 2-1/8	59.4	single control	elec.	6	rem.	not avail.	not avail.
NEPTUNE	Mighty Mite	1.7 @ 4,000	1	1-9/16 x 1-1/2	3.0	none	man.	1/4	int.	17	$ 89.50
OLIVER	Model 6	6 @ 4,000	2	2 x 1-1/2	9.42	gear.	man.	3-1/2	rem.	50	$220.00
	Standard 16	16 @ 4,500	2	2-1/2 x 2-1/32	19.94	gear.	man.	6	rem.	79	$370.00
	Deluxe 16	16 @ 4,500	2	2-1/2 x 2-1/32	19.94	gear.	elec.	6	rem.	not avail.	$470.00
	Olympus 35	35 @ 4,200	2	3-1/16 x 2-7/8	42.35	gear.	elec.	6	rem.	125	$610.00
SCOTT-ATWATER	3.6	3.6 @ 4,000	1	2-1/8 x 1-3/4	6.23	none	man.	1	int.	36	$119.50
	5	5 @ 4,200	2	1-11/16 x 1-11/16	7.48	gear.	man.	3-1/2	rem.	45	$225.00
	7-1/2	7.5 @ 4,200	2	2 x 1-3/4	11.0	gear.	man.	6	rem.	54	$250.00
	10	10 @ 4,200	2	2-11/64 x 2	14.82	gear.	man.	6	rem.	62	$330.00
	Recoil 16	16 @ 4,200	2	2-11/32 x 2-5/16	19.95	gear.	man.	6	rem.	75	$372.00
	Electric 16	16 @ 4,200	2	2-11/32 x 2-5/16	19.95	gear.	elec.	6	rem.	85	$462.00
	Recoil 40	40 @ 5,000	2	3-1/8 x 2-3/4	42.18	gear.	man.	6	rem.	133	$499.50
	Electric 40	40 @ 5,000	2	3-1/8 x 2-3/4	42.18	gear.	elec.	6	rem.	145	$589.50
	Royal Scott	40 @ 5,000	2	3-1/8 x 2-3/4	42.18	gear.	elec.	6	rem.	145	$675.00
SEA-BEE	3-hp. Deluxe	3 @ 4,000	1	2-1/8 x 1-1/2	5.32	piv.	man.	1/2	int.	30	$134.95
	5-hp. Standard	5 @ 4,000	2	1-15/16 x 1-1/2	8.84	piv.	man.	4/5	int.	45	$182.50
	5-hp. Deluxe	5 @ 4,000	2	1-15/16 x 1-1/2	8.84	piv.	man.	4/5	int.	52	$214.95
	12-hp. Deluxe	12 @ 4,000	2	2-1/4 x 2-1/4	17.89	gear.	man.	6	rem.	75	$359.95
	25-hp. Deluxe	25 @ 4,000	2	2-7/8 x 2-3/4	35.7	gear.	man.	6	rem.	119	$464.95
	25-hp. Del. El.	25 @ 4,000	2	2-7/8 x 2-3/4	35.7	gear.	elec.	6	rem.	130	$564.00
SEA KING	3-hp. Deluxe	3 @ 4,000	1	2-1/8 x 1-1/2	5.32	piv.	man.	1/2	int.	32	$105.00
	5-hp. Standard	5 @ 4,000	2	1-15/16 x 1-1/2	8.84	piv.	man.	4/5	int.	46.5	not avail.
	5-hp. Deluxe	5 @ 4,000	2	1-15/16 x 1-1/2	8.84	gear.	man.	4/5	int.	52	not avail.
	12-hp. Standard	12 @ 4,000	2	2-1/4 x 2-1/4	17.89	gear.	man.	2	int.	69.5	not avail.
	12-hp. Deluxe	12 @ 4,000	2	2-1/4 x 2-1/4	17.89	gear.	man.	6	rem.	77.5	not avail.
	12-hp. Electric	12 @ 4,000	2	2-1/4 x 2-1/4	17.89	gear.	elec.	6	rem.	86.5	not avail.
	25-hp. Manual	25 @ 4,000	2	2-7/8 x 2-3/4	35.7	gear.	man.	6	rem.	119	not avail.
	25-hp. Deluxe Electric	25 @ 4,000	2	2-7/8 x 2-3/4	35.7	gear.	elec.	6	rem.	130	$475.00
VOYAGER	V-2N Fisherman Special	4.2 @ 4,300	1	2-1/16 x 1-3/4	5.84	piv.	man.	1-1/4	int.	42	$179.00
	V-3N-GS	6 @ 4,300	2	1-7/8 x 1-3/4	8.66	gear.	man.	1-1/4	int.	46	$233.00
	V-4N-GS	7.8 @ 4,300	2	1-7/8 x 1-3/4	9.66	gear.	man.	3-1/2	int.	47	$249.00
	V-6N-GS	15 @ 4,300	2	2-1/2 x 2-1/32	19.94	gear.	man.	6	rem.	54	$355.00
WEST BEND	2-hp. Shrimp A	2 @ 4,000	1	1-3/4 x 1-9/16	3.76	piv.	man.	7/8	int.	28	$135.00
	6-hp. Pike	6 @ 4,500	2	2 x 1-11/16	10.60	gear.	man.	4-1/2	rem.	56	$245.00
	8-hp. Muskie	8 @ 4,500	2	2-1/8 x 1-11/16	11.97	gear.	man.	4-1/2	rem.	56	$265.00
	12-hp. Barracuda	12 @ 4,000	2	2-3/8 x 2	17.72	gear.	man.	6	rem.	61	$365.00
	30-hp. Shark	30 @ 4,000	2	3 x 2-11/16	38.26	gear.	man.	6	rem.	114	$490.00
	30-hp. Shark Electric	30 @ 4,000	2	3 x 2-11/16	38.26	gear.	elec.	6	rem.	126	$550.00
	30-hp. Shark Generator	30 @ 4,000	2	3 x 2-11/16	38.26	gear.	elec.	6	rem.	127	$580.00
WIZARD	Super 5	5 @ 4,000	2	1-3/4 x 1-1/2	7.2	gear.	man.	3-1/4	rem.	42	$159.50
	Super 10	10 @ 4,000	2	2-7/16 x 2-1/8	19.8	gear.	man.	6	rem.	62	$229.50
	Powermatic 12	12 @ 4,000	2	2-7/16 x 2-1/8	19.8	gear.	man.	6	rem.	72	$299.50
	Super Power 25	25 @ 5,000	4	2-7/64 x 2-1/8	29.78	gear.	man.	6	rem.	106	$399.50
	Super Power 25	25 @ 5,000	4	2-7/64 x 2-1/8	29.78	gear.	elec.	6	rem.	114	$449.50

From *1957 Boats*, by David R. Lindsay, Dell Publishing Co., Inc.

West Bend makes Elgin. Prices are not always as alike as the motors—this is one of the factors to consider when you're comparing what you would like to have with what your wallet can stand.

Just in case you care about sales, Evinrude is reputed to be the leader in the field. ("Reputed" because sales figures aren't made public, but people in the business like to gossip.) Johnson and Mercury run a close race for next place, with Scott-Atwater following them. When you look closely and count in all the brands, Outboard Marine controls the lion's share of the whole business.

Tips on water and gas—to keep your engine healthy

Most manufacturers talk very little these days about two points they used to stress: flushing out engines operated in salt water and burning only unleaded or white gas. The flushing has had to be pretty much passed because many engines are now so heavy that they have to be left on boats most of the time. As a solution for this problem, manufacturers have worked hard to improve corrosion resistance. But if you run your motor in salt water, at least tilt the motor up so the lower unit is clear of the briny when the boat is idle. And when you haul it out to hibernate until next season, a good flushing of the cooling system with a fresh-water hose (or running it for a while in a tank of fresh water) will do wonders for the engine's life.

As to gas, the white kind is still the best for two-cycle motors. Reason: The leaded type, used in cars, tends to build deposits that may partially or wholly short out the spark plugs. Most outboards require more plug changing than any other form of servicing, so don't make matters worse if you can help it. Good news: more white gas is available at outboard boating centers.

proper run-backwards setting. It also moves a lever locking the motor so it won't climb up out of the water in reverse. To go from forward to reverse, including stopping the engine and starting again, takes a second or so.

Another feature on the Mark 75 is its exhaust, which comes out through the propeller hub. According to the drawing-board experts, the gases are thrown much farther back from the boat.

What's next? Just in case the boys at Johnson, Evinrude and Scott-Atwater aren't needled enough by the Mark 75, Mercury engineers are toying with an even bigger power plant. (There are also rumors of a non-piston engine in the trade.) Where it will all end, only the manufacturers of small dock cranes for lifting the engines can say. Although the Mark 75 weighs only about a third of what a comparable inboard might—168 pounds compared to 450 to 500—it costs more than some inboards producing greater power at lower r.p.m.

On the other hand, the public likes big outboards. Dealers report that small engines are taking a dwindling share of the market.

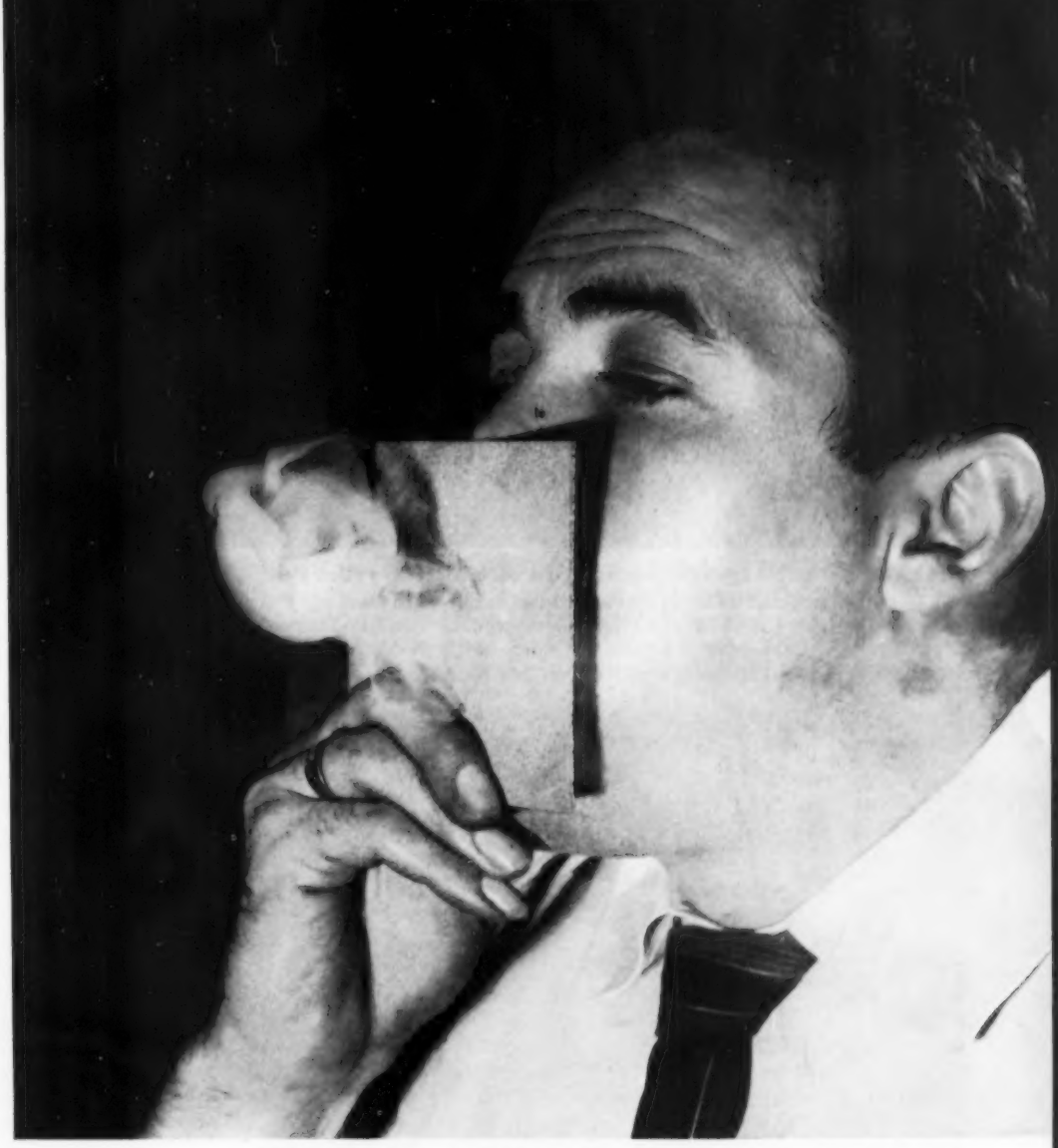
Other developments. The Forward Look (Hi, there, Chrysler!) has hit outboards, too. In the smaller-engine field, Mercury brought out one wholly new small engine, the Mark 10, which has a high-style lean. This follows a development started in 1956 by Johnson and Evinrude with their three-hp. motors. The purpose is to have the propeller stick out behind the boat, with the shaft at an angle and the lower unit submerged less than formerly. The combination of slope and limited draft makes it easier to live with snags and sand bars.

Slip clutches have now definitely taken over from shear pins. All Mercury, Johnson and Evinrude motors have them, and all but one Scott-Atwater. They consist of rubber or neoprene sleeves inside the propeller hub. When the wheel hits an obstruction, the sleeve keeps turning; once the obstacle is past, the assembly turns again. Result: no need to carry extra shear pins. This is more than just an end to an annoyance. On today's motors, which may be too heavy to be lifted into a boat, changing a shear pin would be a job for a long-armed contortionist or a water walker.

This year almost all motors have shifted to 12-volt starting. Generators, which are included or are optional with several motors, aren't really necessary if batteries are used solely for starting, since an occasional charge on shore will pick them up. On outboard cruisers with electric-lighting systems, however, they are a boon.

Style seems to play an even bigger part in outboard selling in 1957 than ever before. Scott-Atwater makes six interchangeable hoods for most of its line so you can match your motor to your girl's get-up. The choice this year includes red, white, mahogany, blue-green and gray. Johnson, Evinrude and Scott-Atwater all make a top engine mechanically like a lower-priced model but blessed with what is euphemistically called "custom" trim. This costs $40 and up. END

Picture News
IN THE WORLD OF SCIENCE

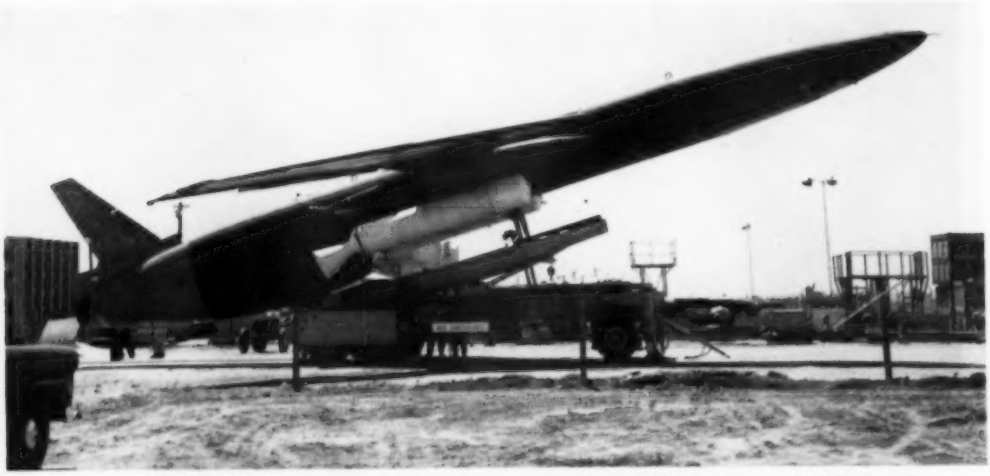


Here's a Sheet of Steel You Can Blow Smoke Through

POROUS steel that "breathes" to let cooling air through, like the smoke going through the sample above, is now under test. Its purpose: to overcome friction heat in supersonic flight. Cuno Engineering Corp., Meriden, Conn., which makes it for missile hydraulic systems, is experimenting with it for transpiration cooling of plane skins and control surfaces.

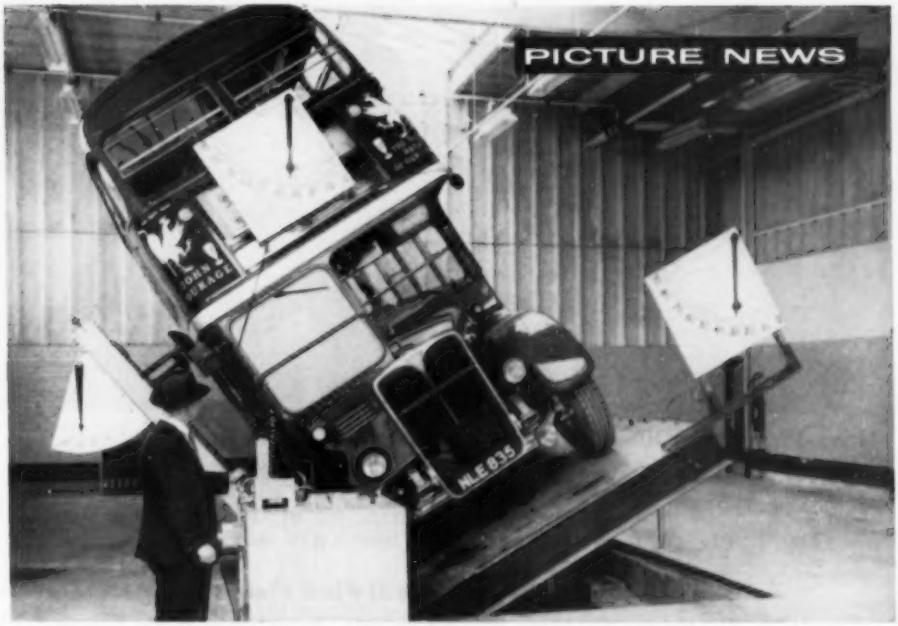
Masked Dog Helps Scientists in Altitude Studies

THIS strange beast is a St. Bernard who is cheerfully aiding the researchers at the USAF Wright Air Development Center. Dressed in protective suits and oxygen masks, the dogs—with monkeys and rats—supply data about physiology at high altitudes and extreme cold.



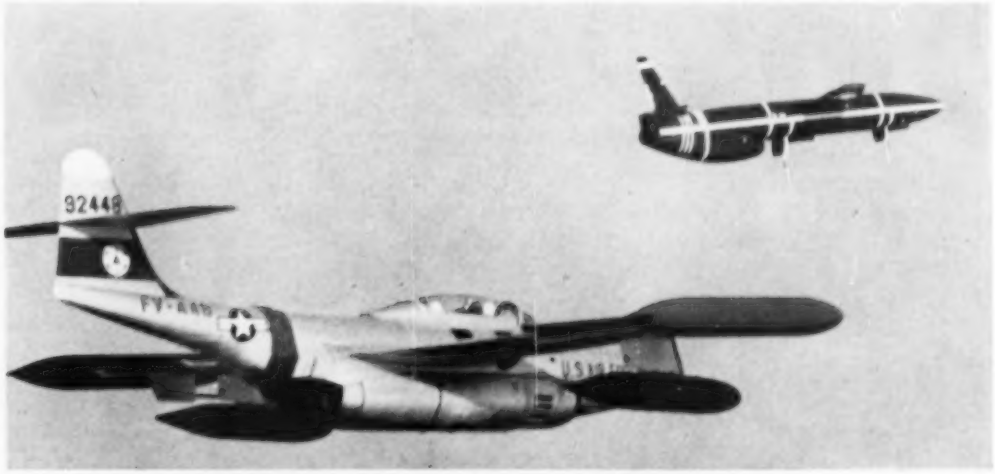
Mobile Launcher Sends Snark Up; "Stilts" Land It Intact

THE deadly Snark, first of the intercontinental atomic missiles to join the Strategic Air Command, is ready to take off here from a mobile launcher. At right, radio-guided by a Scorpion F-89 escort on a test flight without warhead, the 69-foot sweptwing Northrop pilotless bomber



Tipsy Double-Decker Hangs on Edge in Tilt Test

To BE sure they won't keel over on a steep-slope road with soft shoulders, London's buses are test-tilted 28 degrees on a hydraulic platform after every overhaul. With the bottom empty, the upper deck holds ballast equal to 30 riders. The safety arms at left are there just in case.



lowers its "landing legs" as it homes for a landing that will leave its instruments unharmed for another test. The 5,000-mile-range Snark can cruise above weather at 600 m.p.h. to enemy territory and dive on its target at supersonic speed. It may be flown with its launching equipment anywhere in the world and launched there from a small hidden site.

Navy Fighter Refuels at 400 M.P.H. Like Big Brothers

IN THIS first test of a high-speed, high-altitude refueling system to extend the range of the Navy's jet fighters, the trailing F3H-2N Demon above took on 200 gallons of fuel a minute, flying 400 m.p.h. at 40,000 feet. The "buddy" fed it by probe and drogue from a new external tank.

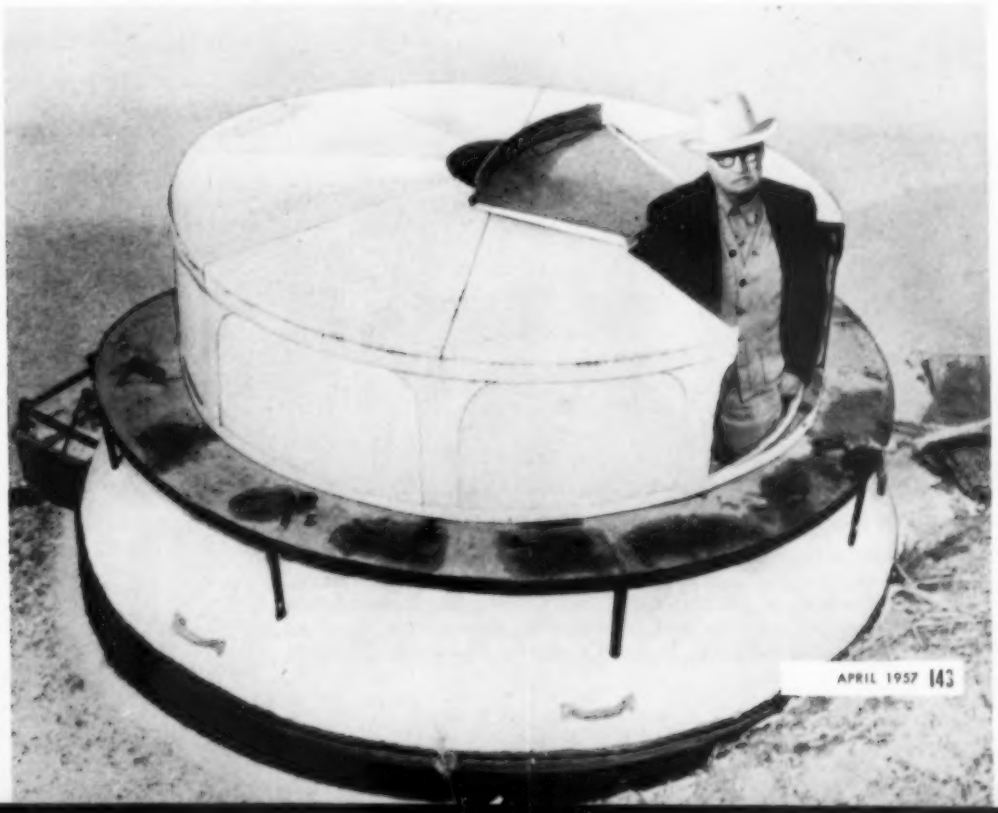
Plush Outboard Saucer Will Find Fish Electronically

THIS circular craft, the "Fisherman," is powered by two Evinrude 18-hp. outboards and continues the futuristic styling of last year's sports-car-like "Lark," also designed by Brooks Stevens. The boat has been displayed with a simulated electronic control system showing how it

Float-In Movie Makes Debut on Swiss River

BOATERS and swimmers as well as motorists can see the show at this new kind of outdoor theater. The big screen, at left, is set up on the River Limmat in Zurich. During movie hours, police block off the river and roads, and spectators watch from barges, boats, bridge and bank.

could be equipped with TV, radar and the latest electronic fishing gadgets. As is, it seats eight plushly and costs $14,000. It's steered, from a cockpit with airplane-type seats, by pivoting the motors and changing speeds. But it isn't a first: Bert Ross of Ottawa, Kan., built the five-hp. round fishing boat below in the 1920's. It seats 11.



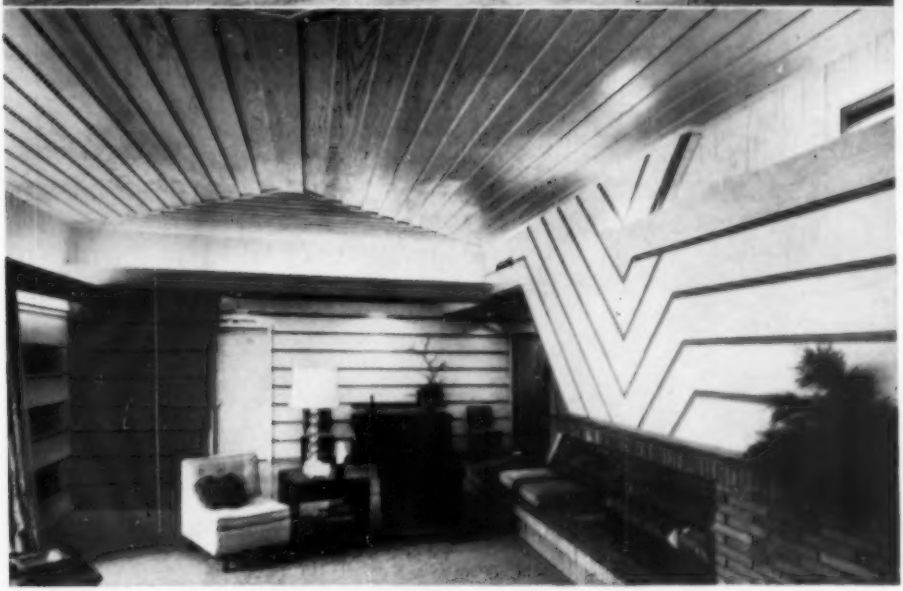
Whirlybirds Do Square Dance

NEW H-19's now form the Army's Helicopter Square-Dance Team based at Fort Rucker, Ala. To the fiddles' twang and a caller's bid, they swing their partners, dozie-do and promenade at air-show hoedowns throughout the country to demonstrate their maneuverability.

At left is a close-up of the painted face of one of the two rustic "swains" in the team. The other two are "girls."

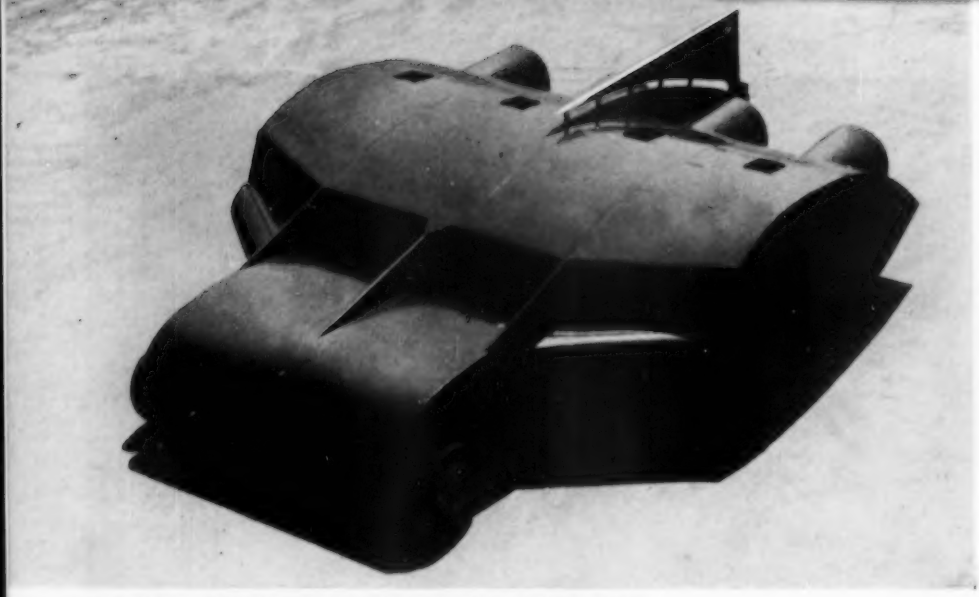
Hawaiian Dome, All Diamonds, Has No Central Pillars

RESEMBLING a huge pineapple, an aluminum dome tops this 1,800-seat auditorium at Henry J. Kaiser's Hawaiian Village Hotel in Honolulu. Utilizing principles of aircraft-wing design, concave diamond-shaped panels were bolted together and braced with struts, thus eliminating the need for interior support. It was put up by 38 men in 20 hours.



All-Pine House Fulfills Lumberman's Dream

COLUMNS enclose closets (as at top), hold recessed shelves and act as room dividers (left in lower photo) in this house built entirely of southern pine. A flat shiplap ceiling appears peaked, and fireplace panels dip to a V. Owner Price Paschal, a lumberman of Brandon, Miss., had it designed by John M. Ware, a Jackson architect.



Test Car Spits Flame from Four Jet Engines

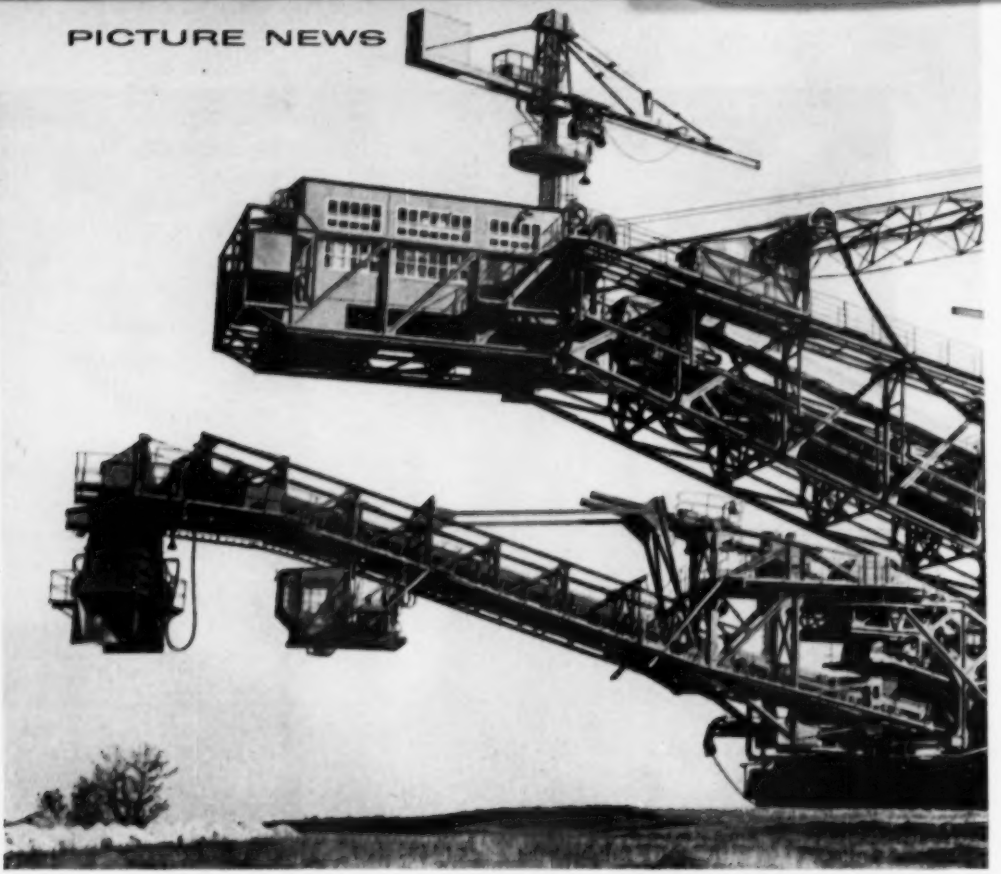
BRIGHT red and jet powered, this hot rodder's dream tests carrier arresting gear for Navy planes. It roars down a test track at 200 m.p.h. plus, pushing plane-weight loads. It stops, the load hurtles on into the gear. All American Engineering Co., Wilmington, built and uses it.

He Builds Better Speed Trap, But Catches No Motorists

GRIM at his living-room window, Larry W. Anderson, of Seattle, clocks a passing car on the speed timer he built from rubber hose and parts of an old pinball machine. City engineers find the timer accurate, but Anderson has to depend on cops to catch the many violators he spots.

"Meteor" Rocket Shows Way to Ultimate Weapon

FOUR stories tall, Lockheed's newly shown X-17 Re-Entry Test Vehicle blasts off from Florida base. At top of six-ton rocket's trajectory, last of three stages turns over, fires, hurtles earthward like meteor. Tests are helping Air Force to design Intercontinental Ballistic Missile that won't burn up when it plunges down at terrific speed from space into air.

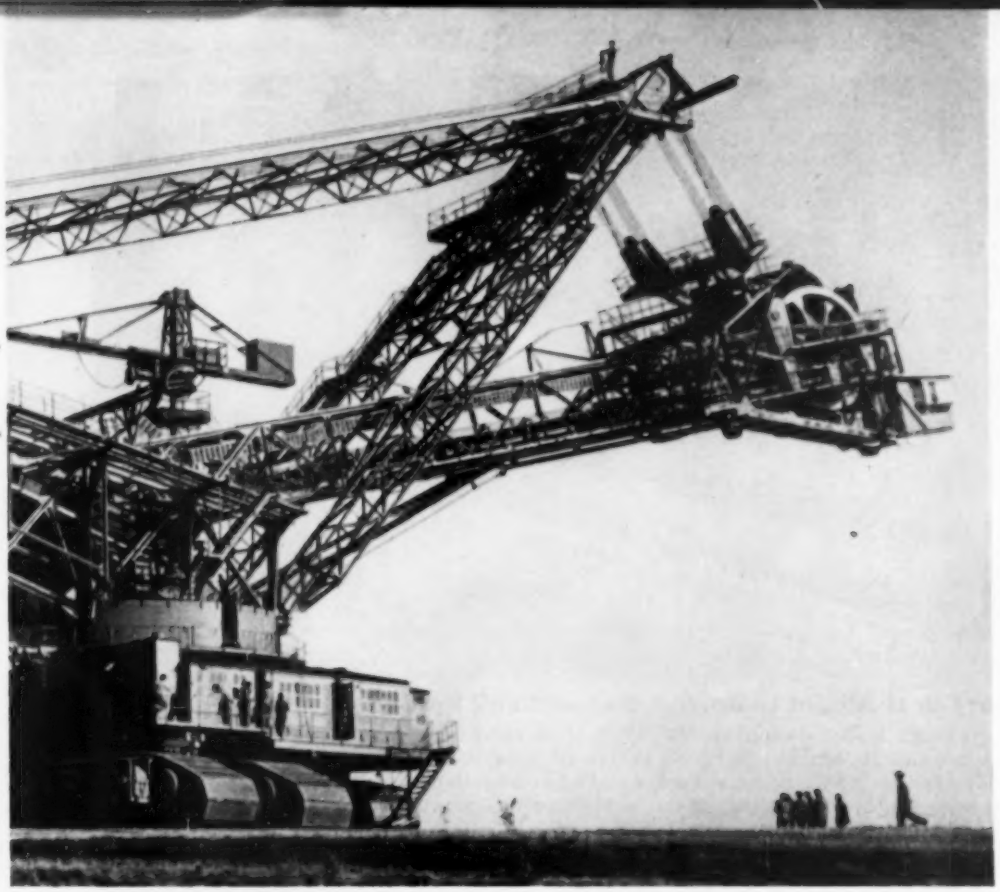


Mammoth Digger Claws 34,000 Tons Out of Earth Daily

CRAWLING on six 36-foot-long tracks, this gigantic 1,900-ton bucket-wheel excavator digs 3,100 cubic yards of coal an hour from East German open-cut mines and belt-conveys it to railway cars as much as 260 feet

Fold-Out Motorcycle Sidecar Opens Up into Tent

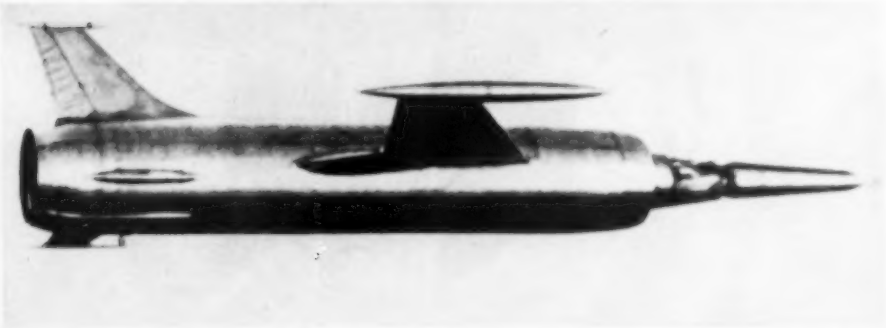
RAISE the roof and spread the hinged floor panel, and this British sidecar becomes a shelter on camping trips. There is room in it for a folding table and chairs, or for sleeping on a couple of air mattresses.

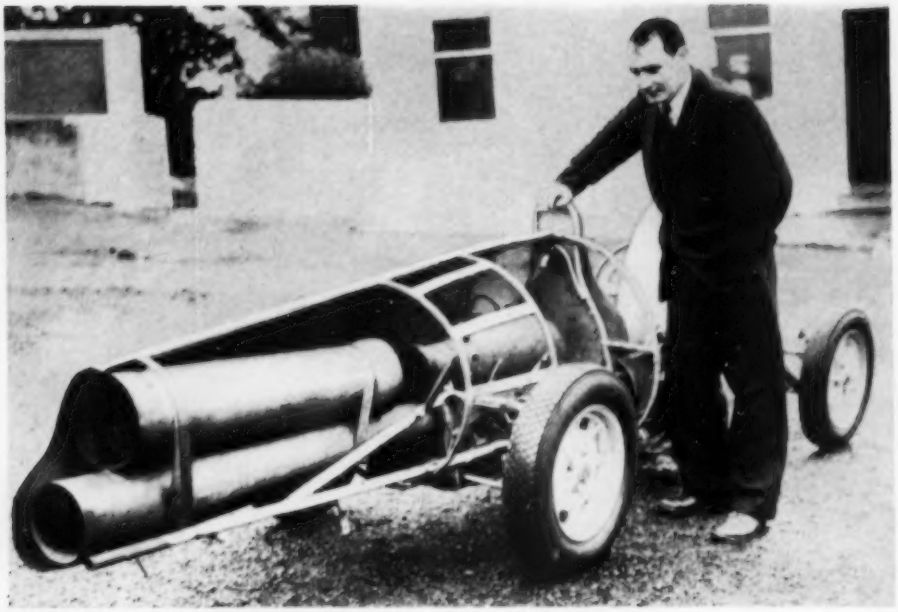


away. The 10½-foot wheel at right, handling eight big buckets, shovels 34,000 tons in an eight-hour day—enough to fill 1,700 20-ton cars. And the big machine carries with it many of the comforts of home for its crew, including rest rooms, in its house-like cabins.

"Flying Stovepipe" Makes First Ramjet No-Tow Takeoff

FRANCE'S Leduc 022, said to be twice as fast as sound, takes off with a turbojet assist. Earlier models had to be released aloft because ramjet engines won't function until they reach high speed.



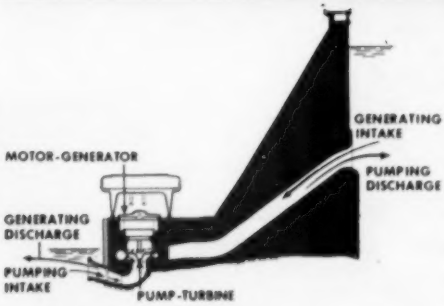


Jet Car Is All Set to Go, but Wheels Can't Roll

STALLED by fuel rationing, this jet-powered racing car has never had a workout. Its builder, J. L. M. Meikle of Bangor, Ireland, estimates that when he saves up enough fuel to slake its two-gallon-a-minute thirst, its top speed will equal that of the fastest small racing cars.

Powerful Gearset Will Help Build Big Planes

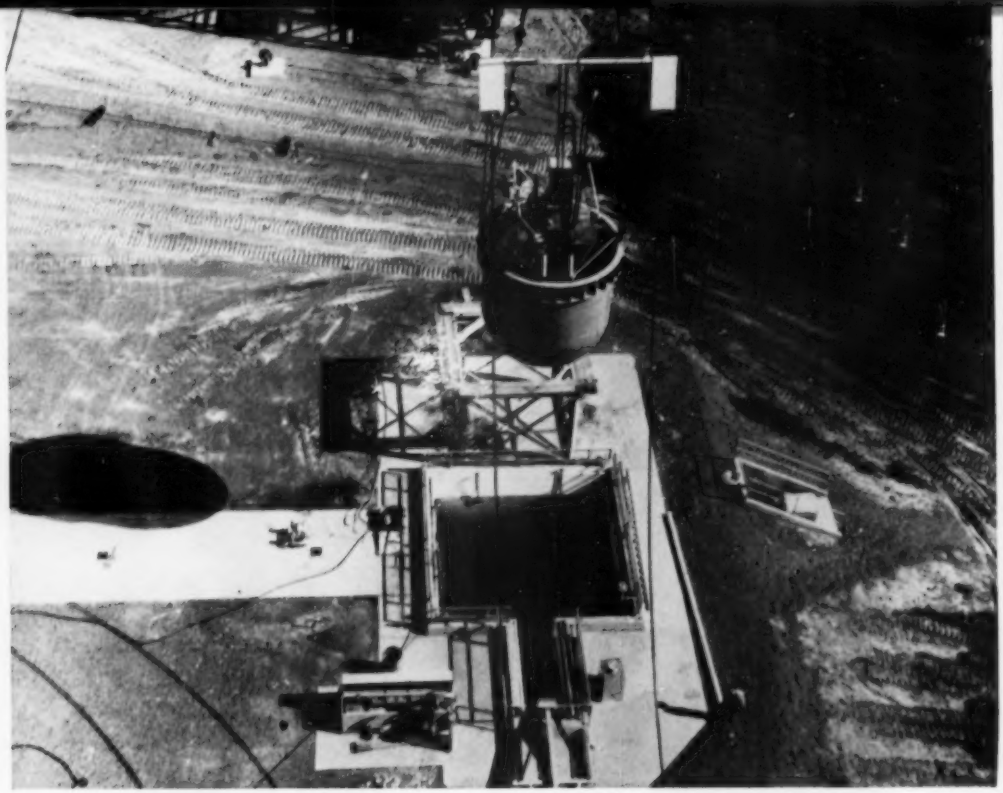
THIS huge gearset will put teeth into the Air Force's heavy press program. To match the force of its whopping 20,000,000 pound-inches of running torque and turn the gear would require a 200-pound man straining at one end of a crowbar $2\frac{1}{3}$ miles long.



Water Goes Two Ways Over Dam

NOT only does the pump-turbine in the left foreground generate power at TVA's Hiwassee Dam, it refills the reservoir. At peak demand hours, it's run as a turbine; water flowing through the wheel rotates the unit clockwise to turn a generator.

In off-peak hours, rotation is reversed with surplus power from other TVA lines, and the water wheel acts as a 102,000-hp. pump lifting 1¾ million gallons of water a minute to the reservoir.



Atomic-Plane Reactor Swings High in Spectacular Test

HUNG from towers that are out of range of its radiation, a shielded nuclear plant gets an "airborne" test at Oak Ridge, Tenn. The white objects above it are ray detectors. Between tests the reactor sleeps in the pool below. A B-36 carried a reactor in a similar test (PS, Oct. '56).

Thermos Bottle on Wheels Hauls Super-Cold Liquid Gas

THE first of a series of projects in the study of extremely low temperatures related to missile and aircraft propulsion, this tank transports 1,500 gallons of liquid gas at 460 degrees below zero. Beech Aircraft puts a powder in the vacuum between its walls to reduce heat radiation.

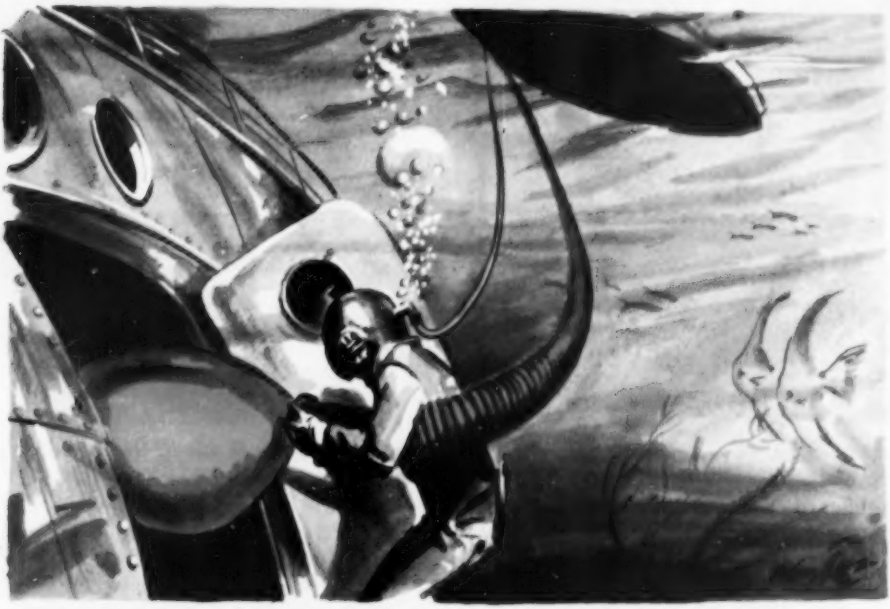
Field Artillery Guides Newest Missile to Direct Hit

THE Lacrosse guided missile, shown for the first time, proves its accuracy in field tests (below), scoring a direct hit between target markers. Designed to augment field artillery, the Lacrosse is launched from a standard Army truck. The Glenn L. Martin Co., which helped the Cornell Aeronautical Laboratory in its development, has it in production.

Underwater Bubble Pipe Keeps Ship Channel Ice-Free

THIS launching slip at a Swedish shipyard is kept open all winter by compressed air pumped through a perforated tube on the bottom. Bubbles bring up warm water to combat surface ice. Atlas Copco Eastern, Paterson, N.J., has installed units also on three Swedish ferry routes.

New Ideas from the Inventors



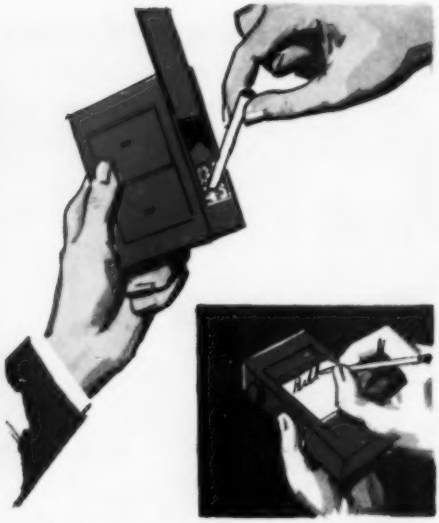
1 Balloons to Raise Sunken Ship. Forcing air-filled sacks into a hull, says this inventor, could displace enough water to float a sunken vessel. After a diver had attached a connecting hose, a compressor and feed mechanism aboard a salvage ship would inflate balloons and discharge them into the submerged hull.

2 Crank to Spatter Paint. To give a wall a color-specked finish, you'd pour paint (of one or more colors) into the chambers of this spattering gun, aim it, and turn a crank. Rotating, cup-ended strips of spring metal would pick up drops of paint and fling them at the wall.

3 Buzzer to Remind You of Lights. You couldn't run down your battery by forgetting to turn off lights if your car had this memory aid wired into its electrical system. Opening a door while the lights were on would automatically cause a buzzer to sound a warning alarm.

Please turn the page for more new ideas

More Inventors' Ideas



4 Rod to Warm Your Hands. To take some of the chill out of cold-weather angling, this inventor would enclose a wick-type glow heater in the handle of a rod. Once lit, the heater's slow-burning fluid would both warm your hands and keep the oiled reel from stiffening up.

5 Cigarette Case to Carry Note Paper. A smoker wouldn't have to scribble memos on the backs of matchbooks if his cigarette case had this built-in paper roll. The crushproof holder would take a full pack in the space between the two windup reels of the paper tape.

6 Outboard Mount to Vary Draft. With your motor mounted on this frame, the propellor could leapfrog over obstructions or work in shallow water. The prop would be held well back of the boat so you could lift the motor without tipping it or shutting it off. A long-armed lever would adjust it vertically.

7 Foil to Hold Plant Moisture. To help plants grow in arid places, Reynolds Metals Co. suggests a machine that would anchor sheets of perforated aluminum foil over seeds it's planting. The foil would slow soil-drying action of the sun, thus keeping more water for roots.

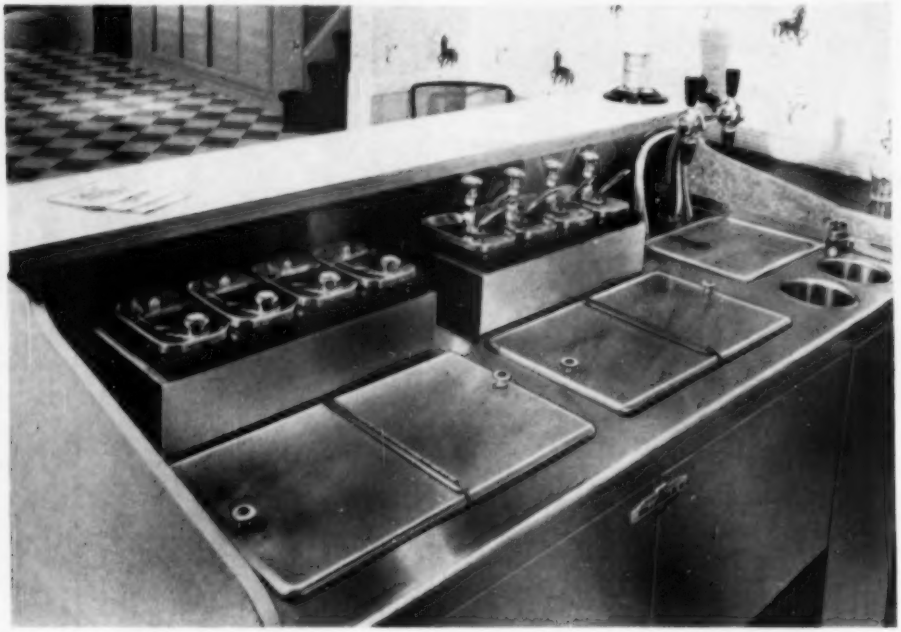
8 Guard to Cover Tack Point. You couldn't scratch yourself on a thumbtack like this, because when it wasn't seated its point would be covered by a soft rubber or plastic bulb. Driving the tack, however, would cause the guard to slide back on the shank and form a cushioned, paper-protecting head.

9 Hinge to Take Up Sag. You could fix a sagging door quickly and without taking it down if it were hung with a pair of these adjustable hinges. A bolt-and-slot arrangement on each hinge would let you shift the door till it was properly aligned, then lock it securely in position.

The following patents *have been issued on these inventions: 1. Patent No. 2,768,601 to Harry W. Davis, Berkeley, Calif.; 2. No. 2,763,510 to Joseph Di Nicola, Brooklyn; 3. No. 2,742,-630 to Hrand M. Mancheryan, Duarte, Calif.; 4. No. 2,758,592 to Clarence R. Phipps, Portland, Ore.; 5. No. 2,716,484 to Goldwin A. Weppler, Vanguard, Saskatchewan; 6. No. 2,713,843 to Thomas G. Staley, Eagle Point, Ore.; 7. No. 2,740,233 to Julian L. Reynolds, Richmond, Va.; 8. No. 2,712,261 to Lincoln D. Anderson, Hanford, Calif.; 9. No. 2,700,709 to Claude V. Cornwell, Louisville, Miss.*

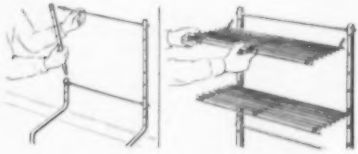
Copies of patents may be ordered, by number, from the Commissioner of Patents, Washington 25, D.C., at 25 cents each. To write to an inventor, if the address given above is insufficient, you may address him (by name and patent number) in care of the Commissioner of Patents.

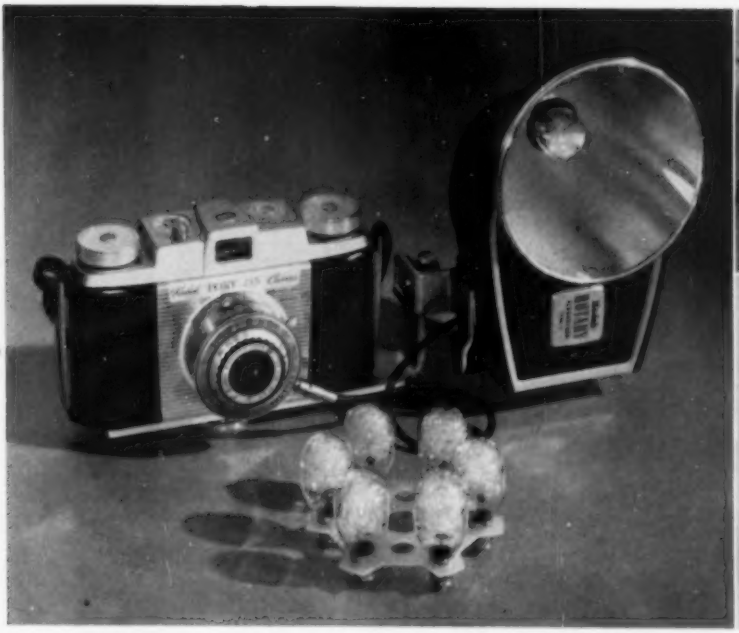
New Aids to Living

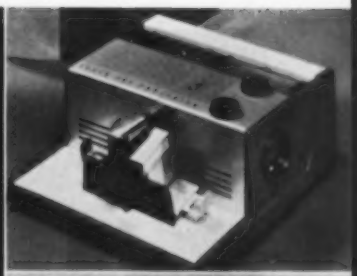


1 Family soda fountain makes any recreation room an oasis for the juke-box crowd. Strung along its 5½-foot length are syrup wells, crushed-fruit jars, soda- and water-draught arms, a sink and a refuse can. Hidden under stainless steel are a compressor, soda and water cooler, freezer, and refrigerator bins. A soda jerk behind it can mix cokes, ginger ale and fruit-flavored drinks for less than two cents a glass, ice cream sodas and sundaes for about a dime each.

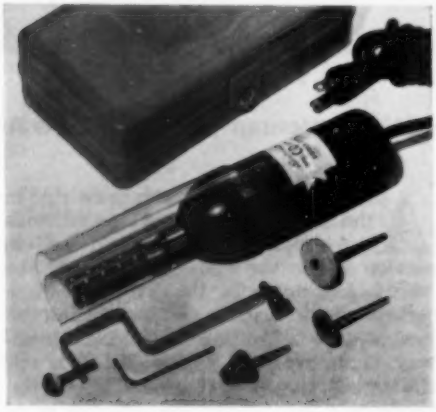
2 Add-on shelf units balance their weight against a wall, or two units bolted back-to-back form a room divider. Steel tubes lock into curved legs and wire shelves hook into spaced holes. By adding on more tubes, the sections can be stretched from floor to ceiling. You can choose black or brass-finished parts, or combine the two.







3 Repeater flashgun loads with a circular magazine (foreground) that rotates to bring new bulbs into position for six shots. The slide changer on the projector at upper right uses a rotary movement to pop slides into place and avoid catching one on another. A second model has an automatic changer with a magazine that stores 36 slides. The built-in-flash camera costs only $8.50. Eastman now makes Ektachrome in 127 size to fit this and other small cameras.



4 Electric fish scaler readies a catch for the pan without fuss or muss. It's also a power tool for sharpening knives, polishing reels, spoons or spinners.

5 Self-propelled wheelbarrow has a 2½- or 3-hp. gasoline engine driving a baby hand truck with a 25-inch-long flat bed. The tray has 1,000-lb. capacity.

More information *about the products shown on these pages can be obtained from: 1. James J. Gavigan Co., 104 Fifth Ave., NYC; 2. DuBoff & Co., 319 Jefferson St., Newark 5, N.J.; 3. Eastman Kodak Co., 343 State St., Rochester 4, N.Y.; 4. Abercrombie & Fitch, 360 Madison Ave., NYC; 5. Gwin, White & Prince, Inc., Skinner Bldg., Seattle, Wash.*

Under the raised hood of the old car, Gus saw a powerful, souped-up engine.

That dark night, the Model Garageman worked as he had

Gus Beats the Gun

By Martin Bunn

A CHILLY wind-driven rain swirled in the headlight beams of Gus Wilson's truck as he was returning from a late service call in the country. Suddenly the husky proprietor of the Model Garage jerked erect in his seat and jammed on the brakes as a figure dashed onto the highway, signaling with a flashlight. Gus cut the wheel sharply and pulled up on the shoulder.

As he rolled down the window, the flashlight, which had been moving over the lettering on the truck, came to rest on his face. The blinding beam of light moved closer—until it blazed into Gus's eyes from an arm's length away.

"Move over," a quiet voice ordered.

never worked before . . . to put two killers back on the road.

The beam lowered slightly and in its light Gus saw a hand holding an automatic. It was pointed at his chest. For a moment, panic seized him.

"Sure," Gus said, easing from behind the wheel carefully. The man got into the driver's seat and the flash beam winked off.

"The gun is in my lap," he said softly as he shifted into gear "I can reach it quick. So don't try any tricks."

They drove down the highway in silence. At last the man said, "We saw you pass by on your way out. We figured you'd be coming back pretty soon. We need a mechanic."

They were turning off the highway now, into a forested area where folks came in summertime for picnics.

"Why the gun?" Gus asked. "Without it, I might not have suspected who you are."

"With the papers full of our pictures? And descriptions going out on radio and TV?" The man snorted. "That's a laugh."

Gus turned a thoughtful eye on him. "I guess you're right," he said. "Two toughies, wanted for murder. I'd say you were the tall one, six foot two, dark hair, dark suit, brown hat. You're Slade, aren't you?"

A soft chuckle answered him. "How right you are, friend."

Ahead of them, the headlights lit up a

small clearing. A blue coupe stood in the center, a man leaning against it. He came out now to the truck.

"Douse those lights, you fool!" he called sharply.

As the lights flicked out, a flashlight appeared in his hand. Its beam played over Gus's face. "Get down, grease monkey, and get to work," the man said harshly. "We didn't bring you out here to go on a picnic."

As Gus eased himself to the ground, the soft-voiced Slade said, "He knows who we are."

"That so?" the man said. He reached out a powerful hand and grasped the front of Gus's coveralls, twisting the cloth, squeezing Gus's chest. For a long moment he gazed thoughtfully into Gus's face.

The sound of wind and rain lashing the trees came to Gus now in the silence. He felt the awful remoteness of this lonely spot. What was to stop these men from killing him? He knew them—Warren Slade and Sidney Bascom, wanted by the police of three states for murder. The soft-spoken Slade, standing behind Gus now with a gun in his back, had shot down a bank teller during a holdup. His partner had seriously wounded a guard.

It was Gus who finally broke the silence. "Let go," he said. "Let's take a look at the car."

SLOWLY Bascom's grip relaxed on Gus's coveralls. "It's the lights," he said. "If they hadn't gone out, we'd have been through the net by now and far away. Your job is to fix the lights."

"Lights or no lights," Gus said grimly, "they'll pick you up. The police will have roadblocks set up."

"Roadblocks!" Behind Gus, Slade chuckled. "I can spot them a mile away at night. Out here in the sticks they don't have enough cops to block all the roads. If we run into any, we can turn around and go the other way. Our car will outrun any cop car. Fix those lights and we'll take care of everything. Get going."

Gus turned slowly, reached into the truck for his tool kit and walked toward the blue coupe. Slade moved carefully behind him while Bascom played his light on the car. It was an old model, a car not apt to attract police attention. Its appearance was deceptive, for under the raised hood of the old car Gus saw a powerful, souped-up engine—four-barrel carburetors, special head, overdrive . . . the works. This job could probably outrun most police cars.

The thought bore heavily on Gus's mind as he reached inside the coupe to turn on the light switch. No lights came on. Gus played his pencil light over the dashboard, noting that the ammeter showed no discharge. Maybe, he thought, there was nothing wrong but a loose connection or a dirty circuit breaker, something he could fix in a moment. And then this pair would be on their way to rob and kill again.

SLADE'S light played over Gus's face. "Any tricks, mister," he said in his soft voice, "and you bleed."

"I'm no fool," Gus said heavily, squeezing in under the dash, peering up at the maze of wires and instruments. Presently he backed out, pawed through his kit, went in again and came out to turn on the light switch. Twin headlight beams sprang into the stormy woods. Bascom cursed as he leaped to turn the switch.

"The rope, Sid," Slade said. "Tie him up—tight." Bascom took a rope from the coupe, came forward in the dim glow of the parking lights, then halted.

Pointing, he growled, "Why no tail lights?" Ferocity came to his sharply hewn features as he moved on Gus with upraised fist. The brawny mechanic turned, shoulders hunched to meet the attack.

"Hold it!" Slade broke in. "How about it, grease monkey? Why no tail lights?"

"You had a blown fuse," Gus said quietly. "Probably a short in the tail-light wire—it will probably blow again."

"Find it and fix it then," Slade ordered. "Fast."

"Maybe I can find it fast and maybe not," Gus said warily. "The quickest way would be to forget the old wire and run a new hot lead to the tail lights."

Slade studied Gus's face for a long moment. "Okay," he said at last.

GUS got a roll of wire from his truck, worked under the dash a few moments, then crawled beneath the car. He emerged at the rear, dripping wet. He turned on the light switch again. This time the twin tail lights glowed.

"Good," Slade said with satisfaction.

"Now tie him up, Sid, and we'll roll."

"Tie a man up in this storm," Gus protested, "and he'll get pneumonia before he's found."

"Tie him," Slade repeated, agate eyes hard above the soft voice.

They tied him in the cab of the service truck and left him. Gus lay there, listening to the storm, wondering how long it would be before he was found. Stan Hicks, his helper in the Model Garage, would think that he had been delayed and might close shop and go home. Gus realized he might be here a long time. Somewhere out there on the highways, he knew, would be men like Officer Jerry Corcoran. They might spot the blue coupe, but what then? Gus tried to visualize what might happen.

ON A night like this, the police would not dare to park a car across the highway without flares to warn the innocent. The deadly pair would be warned, and would flee in the other direction. With escape routes carefully planned, a hideout waiting and their speed, they could make it.

An inner voice reproached Gus. If he had not repaired the coupe's lights, Slade and Bascom could not have stirred.

As time passed, the chill began to bite into his bones. He fought the rope that held him, but it had been too cleverly tied. It seemed to Gus that hours passed before he heard a car, saw its lights moving among the trees.

"Gus," Jerry Corcoran called. "Are you there?"

Gus yelled, "Here. Did you get them?"

"Are you hurt?" Corcoran asked as he worked on Gus's bonds. "No? Good! They told us that they'd tied you up in here. They saw our roadblock and tried to turn back. But something went wrong with their car. They couldn't get it into reverse."

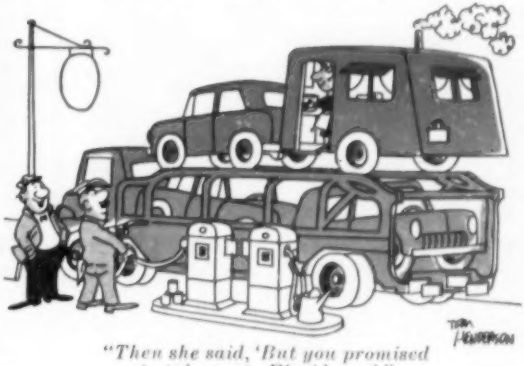
"I know," Gus said. He began chafing his hands and stamping his feet to stimulate circulation. "They wanted me to fix their lights. But when I fixed them I cut the wire to their tail lights under the dash, so that I'd have an excuse to get under the car with wire in my hands to rewire the tail lights."

Corcoran was puzzled. "What's that got to do with their not being able to back up?"

Gus chuckled. "I merely put the cut tail-light wire together again while the lights were turned off. Then, while I was crawling under the car, I strung a hot wire to their overdrive solenoid."

"Come again?" Corcoran queried.

"You see," Gus explained, "when an overdrive-equipped car reaches about 25 miles an hour speed, a governor activates a solenoid to put the drive into overdrive, and at the same time bring about a reverse-gear lockout. I'd run into a few cases where, through a shorted governor, this solenoid was activated when the car was standing still, or traveling below overdrive speed. In these cases you couldn't get into reverse gear at any speed. My wiring eliminated the governor, put juice directly to the solenoid, but permitted the car to move forward in overdrive gears. I figured that sooner or later they'd have to get into reverse to dodge you fellows."



"Then she said, 'But you promised to take me to Florida . . .'"

"WELL I'll be . . ." Jerry Corcoran began. Then, remembering Gus's ordeal, he said, "Jump in, Gus, I'm taking you in before you catch pneumonia."

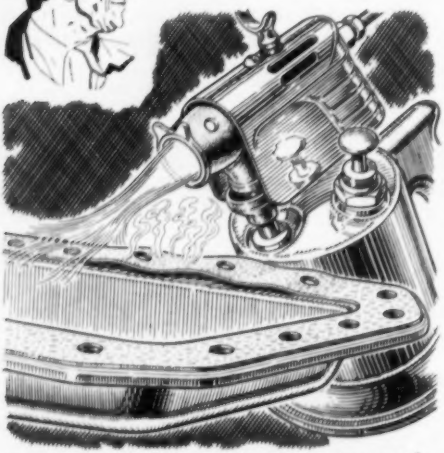
"I'll drive my truck. I'm okay now," Gus said, getting in and starting the engine. "It's got a good heater, and—you know something, Jerry?—since you told me the news I'm not as cold as I was."

"That I can believe," Officer Corcoran said fervently.

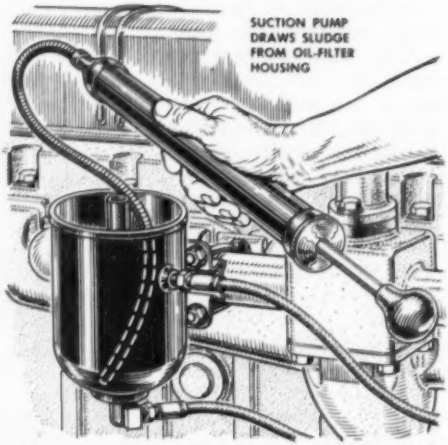
The lights of both vehicles began creeping out of the trees toward the highway. Gus Wilson looked relieved—and a little pleased with himself. END

Next Month: Gus tackles an antique.

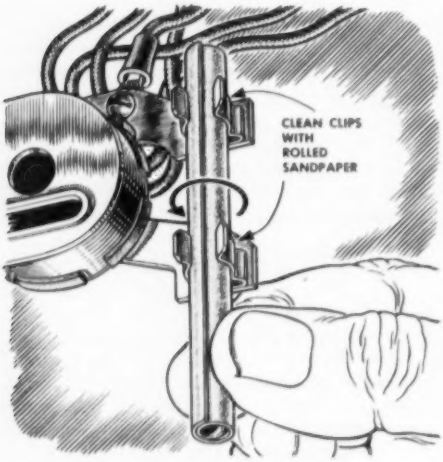
Hints from the Model Garage



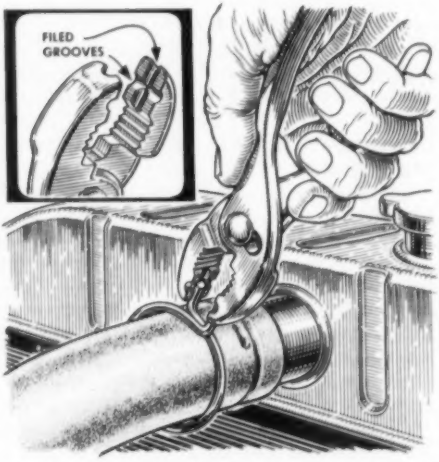
Remove a stuck-on oil-pan gasket without tedious scraping by passing a blowtorch over it. Don't burn the gasket; just heat it until it loosens and peels off easily. Wipe the pan clean before applying the torch, so that the oil doesn't ignite as you play flame around the edge.



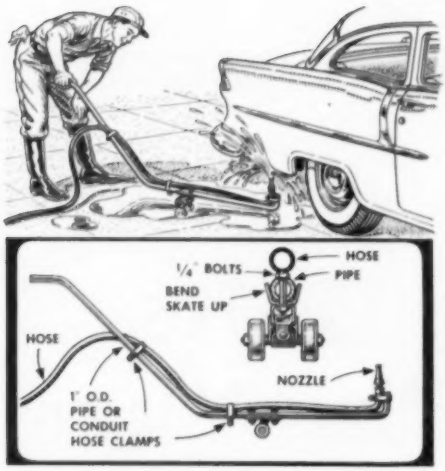
Changing an oil-filter cartridge? it's important to remove the sludge from the bottom of the filter housing. If there's no drain plug, this gook can be drawn out with an inexpensive suction gun used for draining and filling differentials. Then wipe the housing clean with a rag.



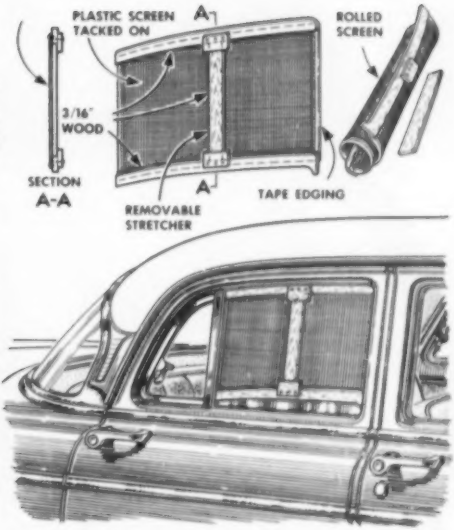
Electrical accessories will give peak performance if the inside surfaces of fuse clips and the fuse ends are clean; corrosion adds resistance to low-voltage circuits. Sand them lightly and bend the clips together slightly for tighter contact.



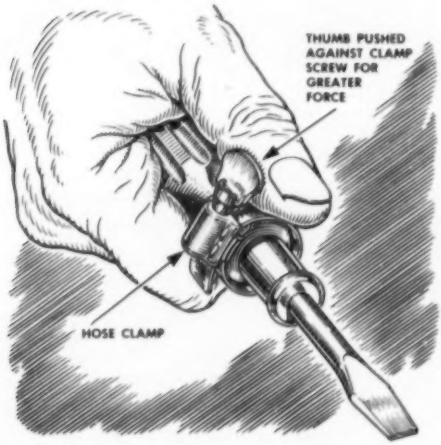
Spring-type hose clamps can be removed easily if grooves are filed in the jaws of a pair of pliers to keep the spring tabs from slipping. File a set of grooves parallel with the jaws and another set across the jaws for use in all positions.



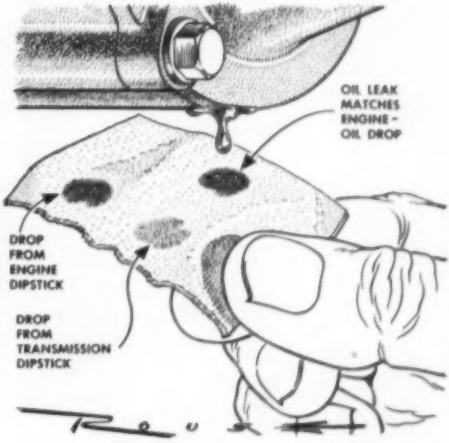
Flush dirt from the underside of a car without getting yourself wet by clamping the hose to a dolly made from a 6′ length of pipe and half a roller skate. Bolt the skate to the pipe and bend up a handle. To avoid a geyser, turn on the water *after* pushing the dolly under the car.



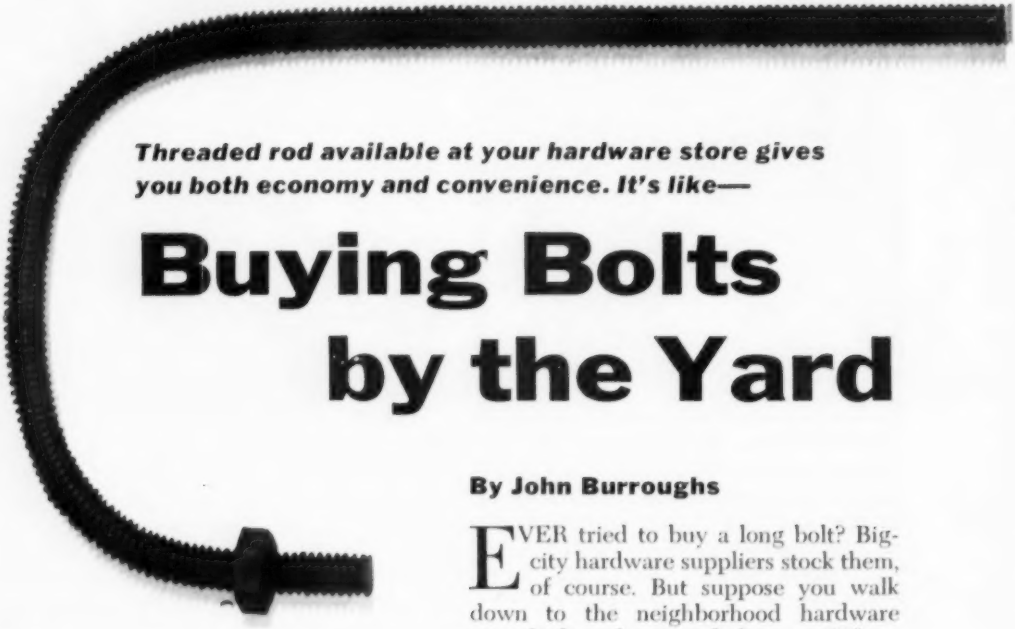
These car screens roll up for compact storage when not in use, yet they can be installed in minutes. Tack plastic screen to an upper and lower spreader shaped to fit the contour of the window. Insert a strip of wood to stretch the screen and secure it by raising the window against it.



Get a better grip on the handle of a screwdriver by tightening a worm-gear hose clamp around the handle near the shank of the blade. Grasp the tool so that your thumb bears against the clamp screw in the direction you're turning.



To locate an oil leak, pull the dipsticks from engine and automatic transmission and let a drop of oil from each fall on a white blotter. Then hold the blotter under the car to catch a drop of leaking oil. Compare the colors.



Threaded rod available at your hardware store gives you both economy and convenience. It's like—

Buying Bolts by the Yard

By John Burroughs

EVER tried to buy a long bolt? Big-city hardware suppliers stock them, of course. But suppose you walk down to the neighborhood hardware store looking for some bolts, say, 7″ long and about as big around as your little finger. You'll settle for any kind—round-head, flathead, machine, carriage, any that are 7″ long. You want to hang a heavy cabinet on the wall of your garage with bolts through the studs.

Nope, says the storekeeper, nothing longer than 6″. How come? He has to buy bolts from his jobber in box or gross lots, and a collection of outsized bolts would kick around the store unsold for years.

But he *does* have a rackful of threaded steel rod. Threaded their entire length.

Your problem's solved, for one of these threaded rods is a handy-dandy, all-in-one, do-it-yourself bolt kit. You simply chop off lengths to suit yourself with a hacksaw, and screw on standard nuts.

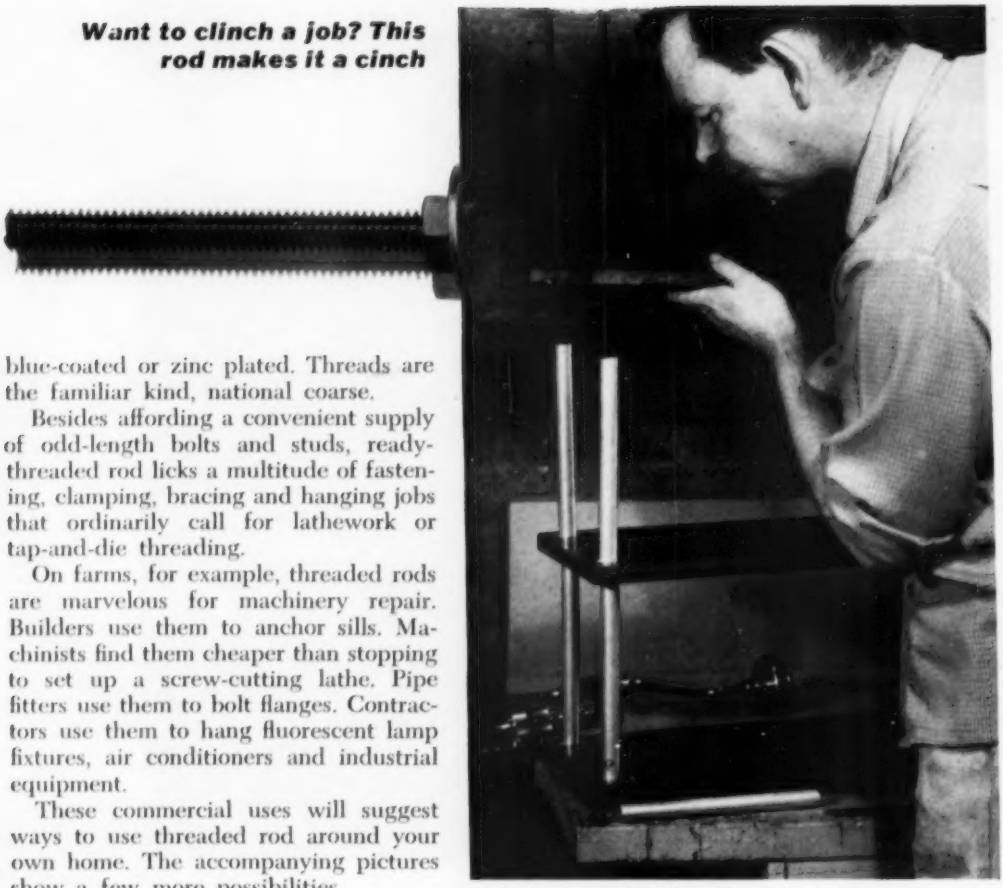
One widely available brand comes in both 24″ and 36″ lengths in diameters from ¼″ through ¾″. The stock is cold-drawn low-carbon steel, the finish either

PICK UP A SUPPLY OF NUTS AND WASHERS when you buy threaded rod at your hardware store and you'll always have exactly the right ones on hand for the job you plan to do.

WHACK OFF ANY LENGTH that you happen to need. Screw a pair of hex nuts on the rod to keep the vise from mashing the threads when it's cut. Unscrewing nuts cleans the thread.

IT'S EASY TO BEND threaded rod to make, for example, special muffler clamps or hot-air duct hangers. Small-diameter rod bends cold. Heat heavier stock cherry red with a torch.

Want to clinch a job? This rod makes it a cinch



blue-coated or zinc plated. Threads are the familiar kind, national coarse.

Besides affording a convenient supply of odd-length bolts and studs, ready-threaded rod licks a multitude of fastening, clamping, bracing and hanging jobs that ordinarily call for lathework or tap-and-die threading.

On farms, for example, threaded rods are marvelous for machinery repair. Builders use them to anchor sills. Machinists find them cheaper than stopping to set up a screw-cutting lathe. Pipe fitters use them to bolt flanges. Contractors use them to hang fluorescent lamp fixtures, air conditioners and industrial equipment.

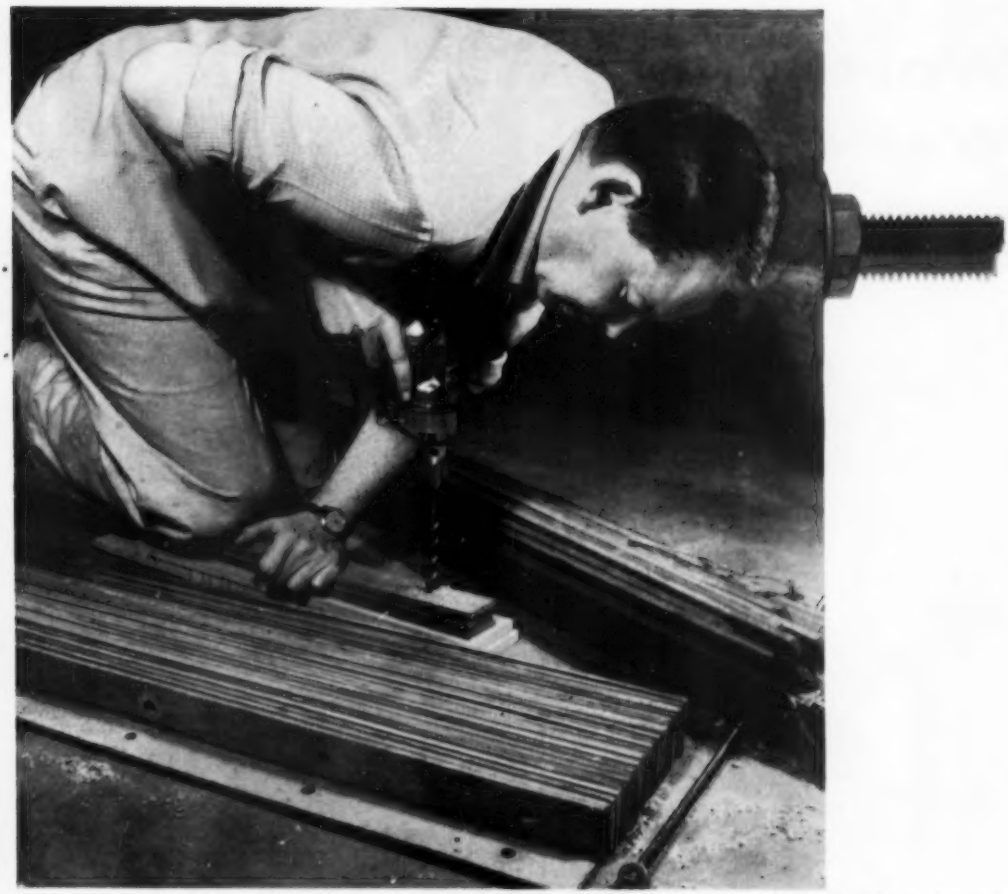
These commercial uses will suggest ways to use threaded rod around your own home. The accompanying pictures show a few more possibilities.

Considering their low cost, it's a good idea to salt a few rods away in your tool cabinet against emergencies.

ONE-EVENING BOOKSHELVES are a cinch. Use threaded rod and tubing—aluminum, brass or perhaps steel conduit. Shallow counterbores in the wood around the rod position the tubing spacers. Apply black lacquer to the shelves.

TO MOUNT WOODEN CABINETS or shelves on concrete walls, set short studs cut from threaded rod in the concrete. Drill holes in the concrete with a carbide-tipped masonry bit and bed the studs snugly in iron cement.

ORCHARDISTS USE THREADED ROD to save fruit trees when a limb tends to split off. It has been found that boring holes through large limbs doesn't injure them. Twisting wire around them can cut the bark and kill the tree.



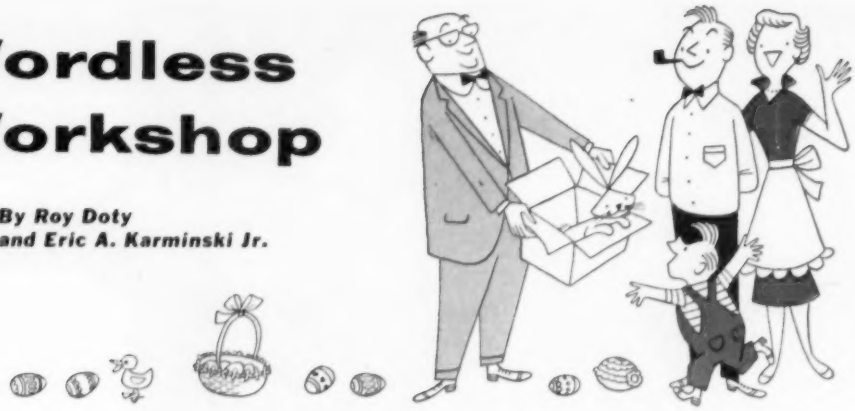
FOR A SOLID WORKBENCH TOP, glue and bolt together old oak flooring, bought in bundles at a salvage building-materials lot. Bore lengths of flooring, brush them with resin glue, then string them on threaded rod and bolt them together tightly. Along both edges glue oak strips counterbored to cover the nuts and washers. Finally, sand the top and ends smooth with floor-sanding disks, fill any nail holes, and finish the surfaces with resin floor-hardener.

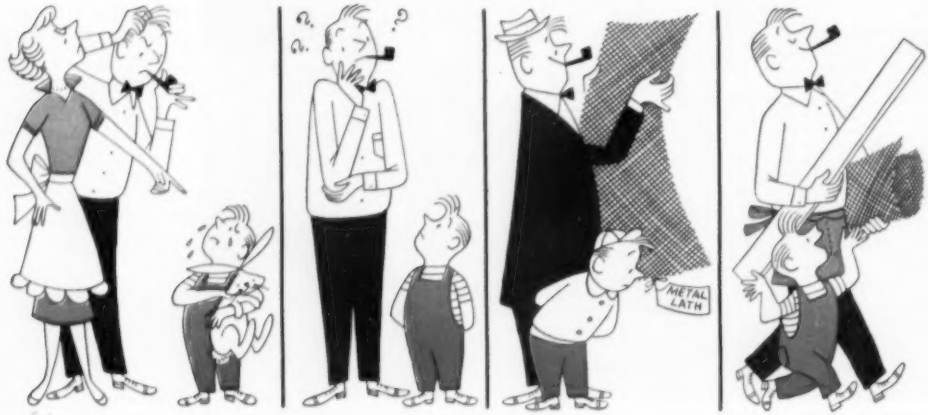
THE RIGHT BOLT never seems to be on hand for a job like this—mounting a power tool on a bench or stand. Having ⅜" threaded rod around the house saves you a trip. Rod is available in diameters from ¼" through ¾".

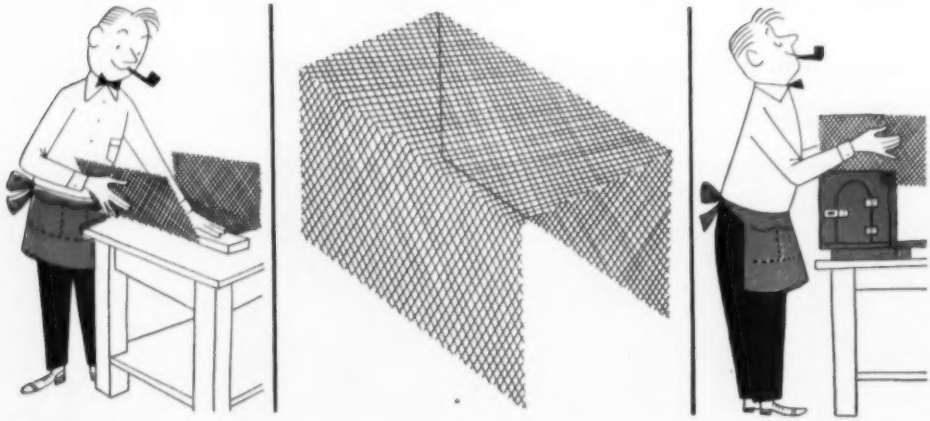
WHEN EDGE-GLUING WIDE STOCK, spare ½" threaded rods will come in handy as light-duty cabinetmaker's clamps. Bore holes in pairs of hardwood blocks, and tighten them against the work with wing nuts. END

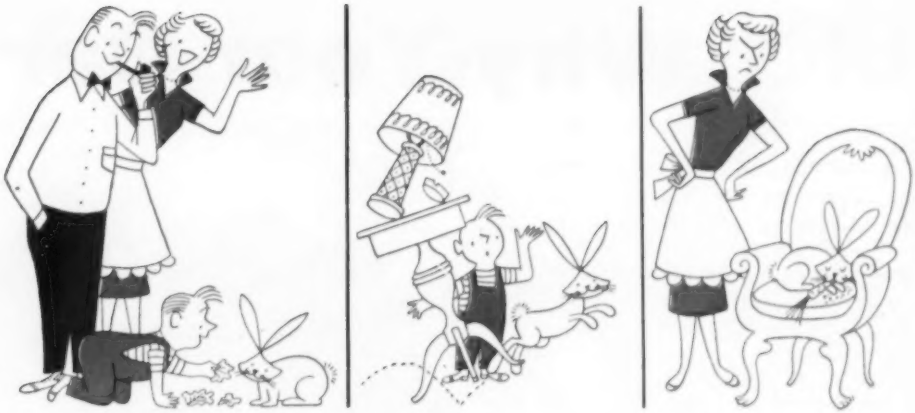
Wordless Workshop

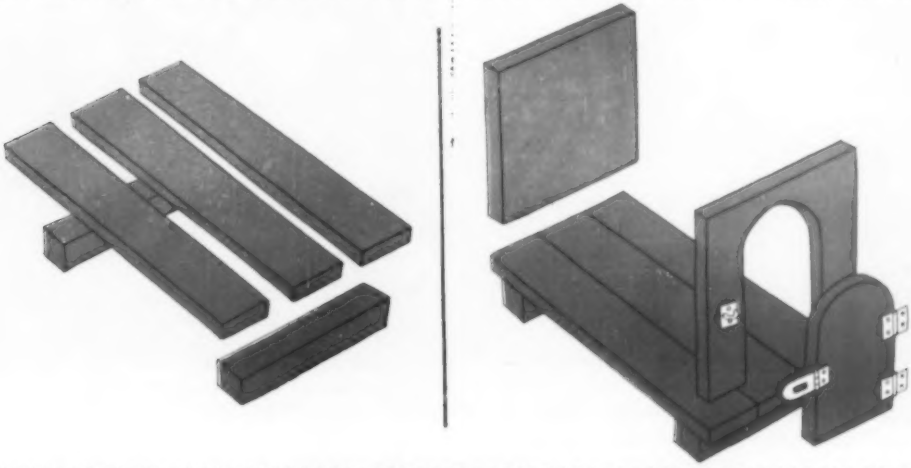
By Roy Doty
and Eric A. Karminski Jr.

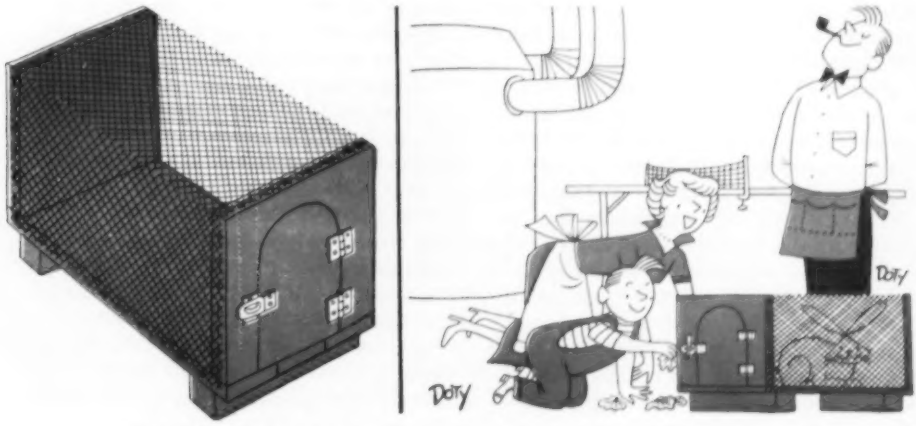












Next Month: A baler that stores and bundles newspapers neatly

Why Your Car

Enemy No. 1: sludge caused by stop-and-go driving. Can you do anything about it? Yes.

By Wesley S. Griswold

YOUR loving wife is your car's worst enemy. In her daily jaunts to market, to visit friends, to pick up the kids, to trundle you to and from the station, she is innocently giving the family bus its hardest wear.

No matter how expert at the wheel, she is still guilty of stop-and-go driving, the chief source of premature aging in engines. If your car needs an overhaul this spring, that is the most likely reason.

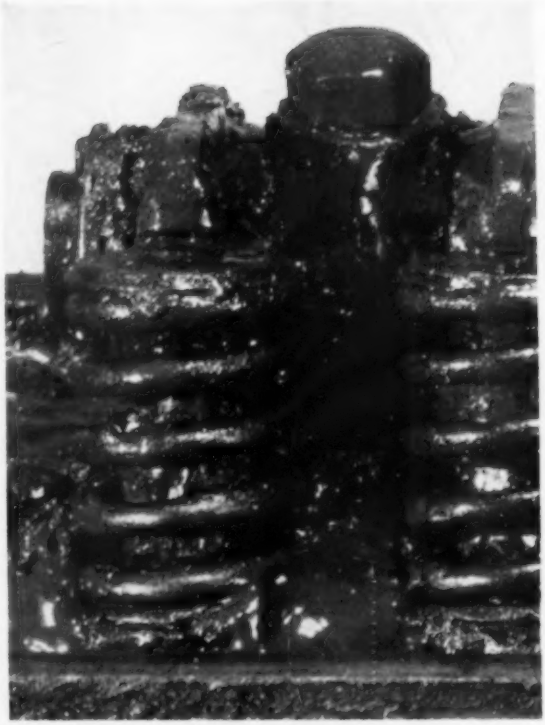
You can comfort your wife with the assurance that she shares her guilt with millions of other drivers, including you. Seventy-five percent of all automobile trips in the U.S. cover less than 10 miles; 50 percent, no more than four miles.

Another name for stop-and-go driving is low-temperature driving. That name pinpoints the core of the trouble. Today's automobile engines and most motor oils perform best at high temperatures, the kind generated by prolonged journeys at brisk speeds. In the myriad short trips that most American drivers take, the motor and the oil never get really warmed up. This tepid running condition sets off a whole train of misfortunes.

Stop-and-go driving is most damaging in cold, damp weather—the colder the climate, the more acute the problem. But there's dirty work afoot even in summer.

Here is what happens in your car's engine on a chilly April day in, say, Maine or Wisconsin or Washington. The temperature of the air is around 38 degrees, but the humidity is high and the day feels much colder than it is.

Your wife starts the car and heads for her favorite supermarket. Gasoline mixed with air at the carburetor is entering the intake manifold. As the fuel evaporates in the air stream (1,000 gallons of air are drawn into the carburetor for each gallon of gasoline consumed), the air-fuel mixture instantly chills 40 to 50 degrees. This frigid draft then hits the hot spot—an exhaust-heated stove—which should be heated to at least 125 degrees to vaporize the mixture properly.

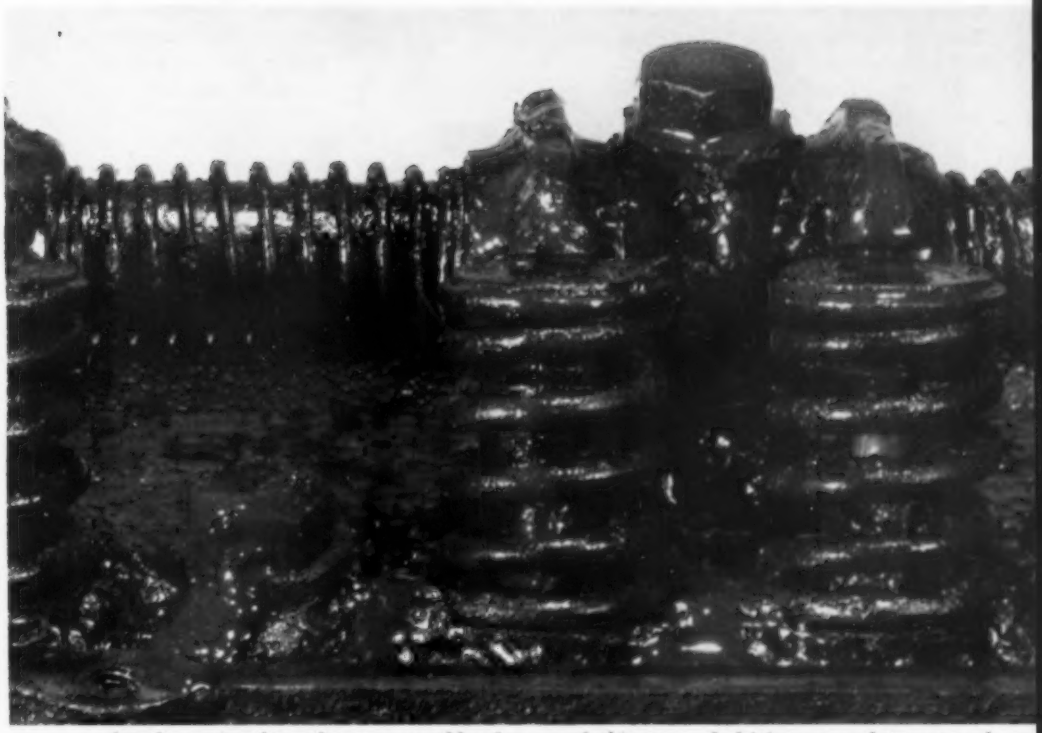


TYPICAL EXAMPLE of the engine problems created in stop-and-go driving is this soup of sludge

The first trouble with stop-and-go driving is that the hot spot rarely gets hot enough to do its job well. This is especially true of older cars, for their hot spots are likely to be clogged with rust and exhaust products.

As a result, part of the fuel doesn't vaporize. Raw gasoline runs down the intake manifold and hits the hot undersides

Engine Grows Old



found covering the rocker-arm assembly of one car. It has been estimated that in 30,000 miles of this type of driving, around two pounds of sludge collects on various engine parts.

of the intake valves, where it stews and forms carbon. Moreover, it flows into the cylinders, where, being a liquid, it doesn't burn thoroughly. Soot from this incomplete combustion clogs the rings and also gets into the crankcase, to form one of the ingredients of sludge. It also gets on the piston skirts to form "varnish"—a brew that is tacky at first and then, as it ages under heat, grows into a hard coating on the pistons. This coating can substantially increase piston friction, robbing the engine of power. In severe cases, varnish may even cause an engine to "seize" or stop dead and refuse to turn over.

Some of the raw gasoline that sneaked past the hot spot, together with moisture from the damp outside air, water formed by "cold" combustion, and condensed acid vapors from the chemical reactions in combustion, reaches the crankcase.

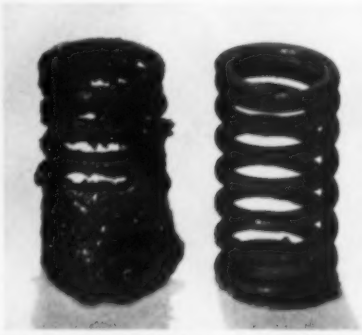
If the crankcase oil isn't heated to at least 140 degrees (and preferably to from 180 to 225 degrees), which would be hot enough to vaporize these unwelcome newcomers and drive them out the crankcase's breather pipe, the new arrivals combine with particles of dust and soot to form sludge. At first the sludge is like black mayonnaise, but it soon hardens and starts to clog the oil screen.

The second trouble with stop-and-go driving is that the crankcase oil seldom warms up to 140 degrees or better. Thus

the formation of sludge goes merrily on.

When engines have accumulated a lot of sludge, oil passages may become clogged. Your car's engine then begins to be starved of oil. Most serious results: Bearings overheat and fail, piston rings fail, pistons get noisy.

Sludge also gathers on the timing chain, where it interferes with lubrication and speeds wear. It fouls finely fitted hydraulic valve lifters. It stifles the flow of oil to the valve rocker arms, causing them to wear rapidly, squeak and clatter loudly. It gathers around the push rods, speeding up their rate of wear, and clogs the oil-control rings on the pistons. When that happens, your car can burn oil at an alarming rate.



DRAMATIC CONTRAST in the condition of valve springs shows the result (right) when an engine has been prepared to withstand effects of stop-and-go driving.

The third trouble with stop-and-go driving is that it frequently produces spark-plug fouling. This, in turn, promotes the formation of sludge. Here's how it works:

The temperature of a spark plug's nose should be at least 1,000 degrees. If it is cooler than that, particularly harmful deposits collect. They are harmful because they are good conductors of electricity. Furthermore, the hotter they get, the better they conduct electricity.

In long, fast automobile trips, utilizing the higher horsepowers of the engine, temperatures of the spark-plug noses range from 1,000 up to around 1,600 to 1,800 degrees. Deposits formed on the plug noses at those temperatures are of different chemical composition. They are as much as 10,000 times more resistant to electricity than the deposits formed when nose temperatures are below 1,000 degrees.

In stop-and-go driving, particularly with old plugs, the noses of the spark plugs seldom get as hot as 1,000 degrees. The harmful deposits collect. You may not be in difficulty as long as you drive slowly, but if you suddenly want to make a quick getaway from a traffic light, the chances are that one or more of the plugs will misfire. The spurt of speed has abruptly raised the temperature of the spark-plug noses, heating the deposits there until they conduct electricity so well that they leak it off to ground and prevent a spark.

When a spark plug misfires, the fuel mixture fails to ignite, and the cylinder cools off. This contributes an extra dose of unburned fuel and condensed vapors to the sludge factory in the crankcase.

A fourth trouble with stop-and-go driving arises from the fact that an unwarmed engine manufactures several corrosive acids, plus an astonishing amount of water (about a pound of water for every pound of gasoline burned). When an engine is allowed to get hot and stay that way, the corrosive liquids are vaporized, do little harm. When the engine runs in short stretches but rarely gets warm, the acids corrode rings and cylinder walls, and also eat into the metal of the muffler and exhaust pipe.

If circumstances force your family to be a brood of stop-and-go drivers, there's little you can do about it. There are, though, some things you can do to minimize the harm.

1. Use oil-change intervals that are based on the *type* of mileage that the car is accumulating. Some auto makers, Oldsmobile for example, advise changes as often as once every 500 miles under cold-sludge conditions.

2. Use motor oil having the American Petroleum Institute's classification "MS." This type of oil was specially designed by motor-oil researchers to help with the problems of stop-and-go driving, and it

[*Continued on page 238*]

New for Your Car

1. Sleeping Bag Fits in Wagon. This combined mattress and bag is made of nylon and filled with a mildew-proof fiber. It fits any station wagon, and has space for two adults or three children. It rolls up to fit into a 16″-by-26″ case.

2. Drum Clock Mounts on Dashboard. You read this clock, developed for 1957 Cadillacs, directly from its rotating drum. A regulator adjusts clock speed automatically at each resetting.

3. Spin-On Filter Speeds Change. With a filter like the one at left, you make a replacement by spinning the old unit off its threaded mounting stud and spinning on a new one. No tools are needed. It is factory equipment on all 1957 Ford-made cars and trucks, and can be installed with an adapter on older Fords, and on Buicks, Oldsmobiles and Pontiacs having full-flow filtration.

More information *about these new car products can be obtained from: 1. Julee Comfortier Mfg. Corp., Holyoke, Mass.; 2. Westclox, La Salle, Ill.; 3. Wix Corp., Gastonia, N.C.*

Washing a House

A few dollars and a day's work with a garden hose, hose brush

By Bernard Gladstone

THE next time you think about painting your house, stop and ask yourself whether a good washing wouldn't do instead. Is it really time for another coat of paint? Or would you be doing the job just to hide accumulated dust and dirt?

Too much paint on a house can do more harm than good. Laboratory tests have shown that it is best to delay repainting surfaces until the last coat has almost worn through. (A good paint job usually lasts five or six years.) This keeps the film from building up to an excessive degree over a period of years—a danger that may eventually cause cracking and peeling because of the sheer weight of accumulated paint.

Most exterior house paints are designed to chalk away gradually at the

Saves Painting

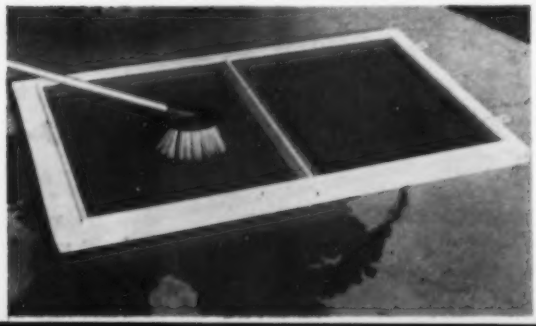
and detergent can make your home look as fresh as spring.

surface. As the paint chalks, the wind and rain are supposed to carry away the dirt, thus keeping the paint looking fresh and clean year after year.

A helping hand is frequently needed to carry the chalking process along, however, especially on sheltered parts of a house. A thorough hosing down will sometimes make everything look new again. But for a really sparkling job, you may have to give the entire house a washing. The job can be done on most houses in less than a day. Work one side at a time, and, as in painting, avoid the sun as much as possible during hot weather. Start on the shady side and follow the sun around.

TO INCREASE YOUR REACH with a hose brush, splice on a tube or broom-handle extension as shown above. Secure it by wrapping tape at intervals around the regular handle and hose.

SCRUB DIRTY SCREENS on a level surface. If yours have copper wire, coat both sides with spar varnish to guard against oxidation. This will minimize stains on paint below windows.



Wet down an entire wall first—with your hose turned on full. Adjust the nozzle to give the strongest possible jet. Pay particular attention to sheltered areas under eaves and gable ends, and to the bottom of the walls along the foundation.

In many communities a lot of the dirt will be mixed with soot or other oily residues. The resultant grime tends to shed water and will not flush away easily with just plain water. When this is in a high area, squirt on some detergent to dissolve the dirt and to act as a wetting agent. The easiest way to do this is to use a siphon type sprayer sold in garden-supply stores for spraying trees and tall shrubs. These hook on the hose and draw the liquid concentrate out of a bucket or attached glass jar. This will be diluted by the water from the hose, so mix a highly concentrated solution in the jar or bucket. Use a detergent that is recommended for painted surfaces.

Squirt on only as much detergent as you can hose off with plain water before it dries. Make sure that areas below have been wetted down so the detergent won't run down and stick on.

Even a detergent won't always get rid of all the dirt. In that case, use a hose brush of the type commonly sold for washing windows or automobiles. These have a hollow handle and screw on the end of the hose. At least one model has an automatic detergent dispenser in the handle, and you can have your choice of detergent-laden water or clean rinse water. Wet the stained area first. Then scrub vigorously with the water turned

[*Continued on page 252*]

NEW BONUS FEATURE

TEAR OUT THIS BOOKLET

TO REMOVE the booklet, place your left hand firmly on this page of the magazine, grasp the booklet with your right, and give the booklet a quick yank. This will free it from the single staple that binds it into the magazine. Then, if you wish, you can trim the projecting edge with a pair of scissors.

Now...start your

Popular Science Reference Library

Popular Science now makes it easy for you to save valuable how-to information. This month you get No. 1 in the new Popular Science Reference Library. Just pull the booklet out of the magazine and save it until you need it. Each booklet will be devoted to a subject of high practical interest to you. This month's is about wood. It clears up confusions that sometimes skyrocket a bill for home improvements. Future issues will contain similar time-saving, money-saving data on other important subjects.

NEXT MONTH: How to Buy a New Car

No. 1

POPULAR SCIENCE REFERENCE LIBRARY

Before You Buy Wood

...read these money-saving time-saving facts

Facts about cutting

MANY characteristics of the wood you buy—including what you can use it for—are determined by how it's cut at the sawmill.

Boards are ripped from logs in two major ways. Flat-cutting (or plain-sawing) is the cheapest, least wasteful method. Most yard lumber is flat-cut. Quarter-sawing is limited mostly to hardwoods.

Flat-cutting produces wider boards, but is likely to give an irregular, prominent grain pattern. Shrinking and warping are other disadvantages.

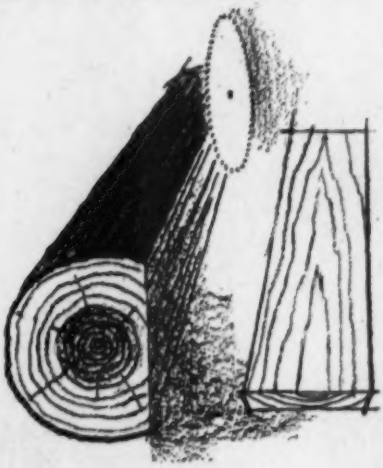
Quarter-sawing is more expensive, but produces a fine, even grain pattern especially desirable in high-quality woods. Quarter-sawed boards are less apt to shrink, warp and split.

Straight grain and cross grain. If wood fibers run parallel to the edges of the board, the grain is called "straight." When they slant across the board, they produce "cross grain."

Straight grain is important for structural strength. It may also give better appearance. Cross grain, which results from spiral growth in the log or improper sawing, is more apt to warp.

Hardwoods and softwoods. Hard-

FLAT-CUT LUMBER has a flat grain that curves across the width of the stock. Sawmill produces this by slicing the logs at a tangent to the tree's growth rings.



QUARTER-SAWED LUMBER, sliced from quarter segments of log, has vertical grain that runs through the thickness of the stock at angles steeper than 45° to the face.

and grading WOOD

woods are not always harder than softwoods. The terms refer to the two classes of trees from which woods come. Hardwoods such as beech, birch, oak, maple, walnut and mahogany are from broad-leaf deciduous trees, which shed their leaves each fall.

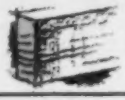
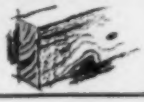
Softwoods such as pine, fir, cedar, cypress and redwood come from coniferous or evergreen trees, which retain their foliage all year. Softwoods are used principally for general construction, paneling, sheathing and siding. Hardwoods are better suited to furniture, flooring and fine paneling.

How lumber is graded. When a lumber dealer refers to "boards," he means stock less than 2" thick and usually more than 6" wide. (Narrower boards are "strips.")

"Dimension" lumber (also called framing lumber) includes structural pieces from 2" to 5" thick, used for studs, joists and rafters. Lumber 5" thick or more is "timber."

Each type is sold in various grades according to the size, number and kind of defects found in them. Both boards and dimension lumber are graded by the same designations, but for different

How boards are graded

	**B AND BETTER** (also called No. 1 and No. 2 clear) is top quality, almost completely clear. It's expensive, but is a good choice for the finest natural finishes.	
	C SELECT has some minor defects such as small, tight knots, but takes a good natural finish. D Select, stocked by some lumberyards, has more blemishes.	
	NO. 1 COMMON (also "Construction") may have many small, sound knots, none larger than about 2" and rarely on edges. Paint hides most but not all its defects.	
	NO. 2 COMMON (also "Standard"), an all-around utility grade, has same defects as No. 1, but knots up to 3½" and some on edges. Even paint won't hide everything.	
	**NO. 3 COMMON** (also "Utility") allows loose, coarse and missing knots, also splits and pitch. A lower, No. 4 or "Economy" grade is also available at some yards.	

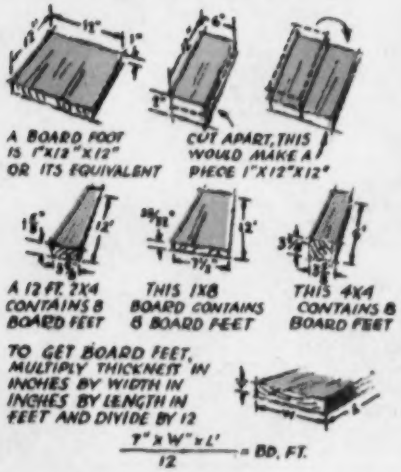
Common lumber sizes

Nominal (Rough)	Actual (Surfaced)	Nominal (Rough)	Actual (Surfaced)
1/2"	7/16"	2"	1 5/8"
1"	25/32"*	3"	2 5/8"
1 1/4"	1 1/16"	4"	3 5/8"
1 1/2"	1 5/16"	6"	5 1/2"
2"	1 5/8"	8"	7 1/2"
3"	2 5/8"	10"	9 1/2"
4"	3 5/8"	12"	11 1/2"

*In grade-rule changes under consideration at time of publication, the proposed minimum thickness for 1" boards is 3/4".

Nominal (Rough)	Surfaced 1 Side (S1S)	Surfaced 2 Sides (S2S)
3/8"	1/4"	3/16"
1/2"	3/8"	5/16"
5/8"	1/2"	7/16"
3/4"	5/8"	9/16"
1"	7/8"	13/16"
1 1/4"	1 1/8"	1 1/16"
1 1/2"	1 3/8"	1 5/16"
2"	1 13/16"	1 3/4"
3"	2 13/16"	2 3/4"
4"	3 13/16"	3 3/4"

How you are charged



purposes. Boards are graded primarily for appearance: Their faces show. Dimension lumber is graded for strength since it must support loads.

The highest-grade boards are almost completely free of knots. This grade is often sold as "shelving" for interior uses. Lower grades contain knots, splits and pitch. These are sold for rough construction and exterior uses.

Selecting lumber. By looking over lumber grades carefully, you can choose the cheapest one that will do for your purpose. Don't buy the most expensive clear grade if you're going to cover it up with paint. On the other hand, a low, knot-filled grade may be fine for rustic paneling.

Dark woods, such as redwood, may come mixed with very light pieces of sapwood (outer growth). This is all right for painting. But if you want a uniform dark finish, ask for "clear, all heartwood."

Dimension lumber is harder to choose because the grading—for strength rather than looks—is more complicated. Most yards do not stock all grades, but usually have at least a "high" and "low" grade in each type of lumber.

If you're building a garage or addition to your house, you'll need a high grade that has good strength. Local building codes may specify grades that must be used; check these before you undertake major construction.

Lumber is sold by the "board foot" measure. This is equivalent to a piece 1" thick and 12" square. If you know the board-foot price, you can find the cost of any size or shape lumber by using the method shown above. Prices are based on nominal, not actual, dimensions. In softwoods, thicknesses less than 1" are charged as a full inch, while in hardwoods the prices vary.

How dry is it? Lumber for interior

uses such as trim and cabinets should be kiln-dried (thoroughly dry air-dried wood is hard to find). Kiln-dried stock may have a moisture content of from six to 12 percent.

Lumber for framing and exterior uses can be either kiln- or air-dried. It should not have more than 20 percent moisture. Wood any wetter than this is considered green. It will shrink badly and may not hold paint.

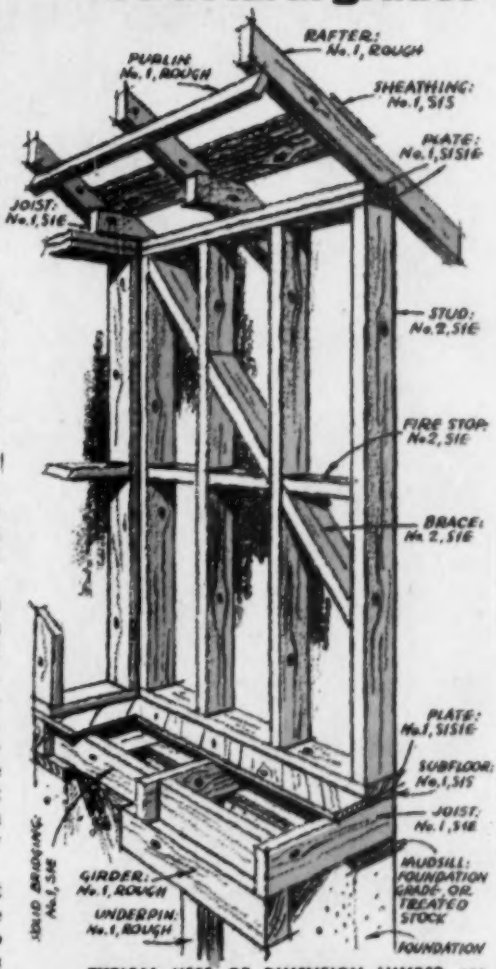
Sizes. The actual dimensions of the lumber you buy are less than the nominal sizes you ask for. A rough two-by-four starts out as 2″ thick and 4″ wide. But it becomes thinner and narrower as it's surfaced to make it smooth. If you want a 4″ piece, you'll have to cut down a two-by-six.

Lumber 2″ to 4″ thick or wide usually loses ⅜″ in surfacing, but can be up to ½″ smaller. Between 6″ and 12″ it loses ½″ to ¾″. Above 12″ the loss is as much as a full inch. Hardwoods lose less in surfacing than softwoods and come in different actual sizes. Because of these variations, measure the lumber you buy carefully.

Lengths, unlike other dimensions, are never less than the size you ask for. A 10-footer is at least 10′ feet long and may be an inch or so longer. Lengths usually come only in even-foot sizes.

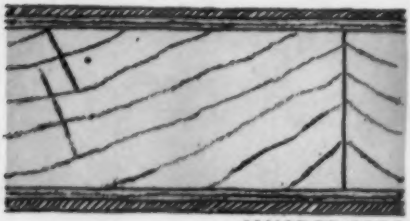
Some lumber can be bought surfaced on only one side, on one side and one edge, or on two sides, and so on. These variations create slightly different dimensions. Where uniform construction is needed, such as in the width of studs and joists, be sure to buy lumber that's all surfaced the same way.

Structural grades

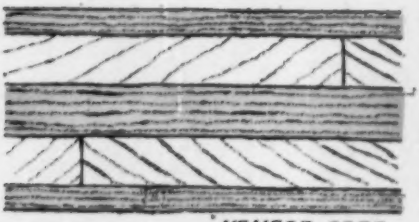


TYPICAL USES OF DIMENSION LUMBER are shown above. In general, horizontal structural members are under greater stress and should be No. 1 Common grade. For vertical members, such as studs, No. 2 Common is adequate. In the drawing above, S1S stands for surfaced-one-side; S1E, surfaced-one-edge; S1S1E, surfaced-one-side-one-edge.

Facts to help you pick



LUMBER CORE



VENEER CORE

PLYWOOD is a highly versatile material. Depending on type and grade, it can provide weather resistance, beautiful grain, strength and toughness, flexibility, or a combination of these. It can save work by eliminating or simplifying framing. It gives you wide surfaces ready-made.

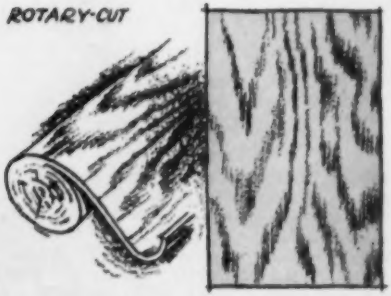
Fir plywood is the most common type. For the finest finishes, you can get plywood faced with your choice of many hardwood veneers—mahogany, walnut, birch, cherry, gum and other handsome woods.

Core construction. If you look at plywood edges, you'll find two main types. *Lumber-core plywood* has a thick middle layer of solid wood. This is just the thing for fine furniture.

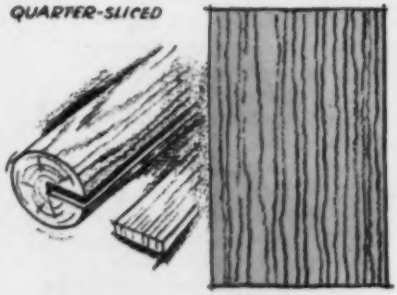
For most jobs, the cheaper *veneer-core plywood,* made up of many thin

Three ways of cutting veneer give you

ROTARY-CUT



QUARTER-SLICED



the best in PLYWOOD

layers or plies, will do. It has three, five, seven, nine or more plies depending on thickness.

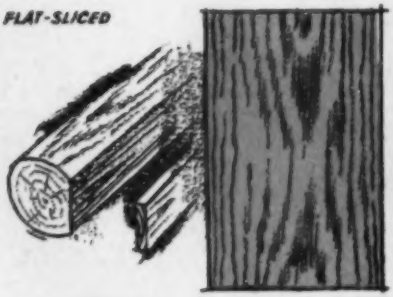
Some sizes also come in different numbers of plies within the same thickness. You can buy ¼" plywood with either three or five plies. In general, the more plies, the stiffer the board and the less it will warp. Where you need high rigidity, such as for loudspeaker cabinets, ⅞" plywood with nine plies is a better choice than ¾" with seven.

Sizes. Sizes in plywood are actual as sold. A ⅞" piece is ⅞" thick. Common panel dimensions are 3'-by-8', 4'-by-4', 4'-by-6', 4'-by-8' and 4'-by-10'. A special 5'-by-9' panel is now made for Ping-pong tables.

For outdoor projects, plywood is made in an exterior type, with waterproof glue, and will last indefinitely.

different grains

FLAT-SLICED



Veneers. Veneers for plywood are cut three ways. For fir plywood, they're rotary cut—sliced off a log like peeling an apple. This gives them a prominent, often wild, zigzag grain.

Most hardwood plywood veneers are either flat-sliced, which gives a milder but still prominent grain, or quarter-sliced, which is the most expensive and gives a fine, striped pattern.

Grades. The quality of the two faces of a panel determines its grade. In softwood plywoods, a "good" face consists of a single sheet of smooth, clear veneer. A "sound" face may consist of two pieces perfectly joined but with small patches, stains or sapwood. A "utility" face may have knots, pitch pockets, knotholes, and small splits.

The most expensive grade has two good sides (designated as G2S). This is needed only for natural finishes when both sides will show. Where only one side will show, a "good-one-side" panel (G1S) wil save you money.

For painted projects, the sound-two-sides (S2S) grade will do, or even the sound-one-side (S1S) when only one side shows. Wallboard grade (WB) has a sound face and utility back. Sheathing (SH) has two utility faces and comes unsanded.

Another grading system designates faces as A, B, C and D. An A-A panel has two good faces, one marked A-C a good face and utility back.

Hardwood plywoods are graded by still another system. The charts on the following pages will help you pick the right types of both hardwood and softwood plywoods for many different jobs.

Interior softwood plywood (fir)

GRADE NAME*	TYPES AND USES	VENEER QUALITY			STOCK SIZES		
		Face	Back	Inner Plies	Width	Length	Thickness
A-A	Best grade for all interior uses where both sides will show, such as cabinet doors and furniture.	A	A	D	3', 4'	8'	1/4", 3/8", 1/2" 5/8", 3/4"
A-B	Alternate for A-A grade for high-quality uses where only one side will show, such as cabinets, built-ins, top-grade wall paneling.	A	B	D	3', 4'	8'	1/4", 3/8", 1/2" 5/8", 3/4"
Plypanel	All purpose "one-side" panel for less expensive wall paneling, cabinets where only one side will show. Also for counters, backing, underlayment for floors.	A	D	D	3', 4'	8'	1/4", 3/8", 1/2" 5/8", 3/4"
B-D	Utility panel with lower grade face. If painted, a good substitute for A-B.	B	D	D	4'	8'	1/4", 3/8", 1/2" 5/8", 3/4"
Plybase	Underlayment grade for subfloors and base for tile, linoleum, carpeting.	C	D	D	4'	8'	1/4", 3/8", 1/2" 5/8", 3/4"
Plyscord	Unsanded grade for wall or roof sheathing, subflooring, rough or temporary construction uses.	C	D	D	4'	8'	5/16", 3/8", 1/2" 5/8", 3/4"
Plyform	For re-usable concrete forms, oiled and edge-sealed, but not as durable as exterior-grade Plyform.	B	B	C	4'	8'	5/8", 3/4"

*Grade names established by the Douglas Fir Plywood Association

Hardwood plywood

GRADE NAME*	GRADES AND USES (Sizes: widths from 24" to 48" inch multiples, lengths from 36" to 96" plus 10' and 12' on order.)
Custom Grade	For highest-grade natural finishes. Veneers are selected for clear, uniform and matching grain with practically no blemishes. Also includes architectural panels, technical types and special matched-grain panels. Expensive except for best cabinetwork or paneling.
Good Grade (1)	For fine natural and stained finishes on cabinets, built-ins, paneling and furniture. Veneer has typical species grain markings, occasional small burls, pin knots and slight color streaks, but is smooth, tight and matched in grain where two pieces join. Comes in both good-one-side and good-two-sides grades. (Some mills identify as A grade or 1 grade.)
Sound Grade (2)	For less-costly natural finishes or high-grade paint finishes. Veneers are not selected for color or appearance and may have sound, tight knots, small burls, patches, sapwood and mineral streaks. They are, however, firm, smooth and free from physical defects that would mar a paint finish.
Utility Grade (3)	For rough paint or natural finishes, such as for children's furniture, storage cabinets, shelves, playroom paneling. Has same defects as Sound Grade plus small splits not wider than 3/16", rough grain and knotholes up to 3/4"
Backing Grade (4)	Cheapest grade of hardwood plywood for construction uses where appearance does not matter or possibly as very rough, rustic paneling. Has knots, knotholes up to 2", splits and other defects that do not impair its strength.

*Grade names established by the Hardwood Plywood Institute

Exterior softwood plywood (fir)

GRADE NAME*	TYPES AND USES	VENEER QUALITY			STOCK SIZES		
		Face	Back	Inner Plies	Width	Length	Thickness
A-A	Permanent water-resistant plywood for exterior uses where both sides will show, such as for outdoor furniture, fences, carports, signs.	A	A	C	4′	8′	1/4″, 3/8″, 1/2″ 5/8″, 3/4″, 1″
A-B	Alternate for A-A grade where appearance of back side is less important.	A	B	C	4′	4′	1/4″, 3/8″, 1/2″ 5/8″, 3/4″, 1″
Plyshield	"Good-one-side" grade for uses where back side won't show, such as for siding, soffits, fences, paneling.	A	C	C	4′	8′	1/4″, 3/8″, 1/2″ 5/8″, 3/4″, 1″
Utility	All-around outdoor construction panel for less expensive farm buildings, summer cabins, fences, playhouses.	B	C	C	4′	8′	1/4″, 3/8″, 1/2″ 5/8″, 3/4″
Underlayment	Backing or subfloor for linoleum, tile, wall coverings, especially in high-moisture areas such as kitchen, bath, basement and attic.	C	C	C	4′	8′	1/4″, 3/8″, 1/2″ 5/8″, 3/4″
Sheathing	Unsanded panel for rough construction exposed to weather or excessive moisture, such as sheathing, subfloors, sheds.	C	C	C	4′	8′	5/16″, 3/8″, 1/2″ 5/8″, 3/4″
Plyform	Oiled, edge-sealed panels for maximum re-use as concrete forms.	B	B	C	4′	8′	5/8″, 3/4″

*Grade names established by the Douglas Fir Plywood Association

Specialty plywood

NAME	TYPES AND USES	STOCK SIZES		
		Width	Length	Thickness
Texture One-Eleven*	Exterior plywood with 3/8″-wide grooves for decorative siding, gable ends, carports, fences. Has shiplap edges.	16″ 32″ 48″	8′, 10′	5/8″
Special Surfaces	Striated face to give comb-look, brushed face to accentuate grain, and embossed panels for decorative cabinets, paneling and siding. Comes in both interior and exterior grades.	4′	8′	5/16″, 3/8″
Overlaid Plywood	Plastic-faced exterior plywood for high-grade paint finishes that won't show grain, such as for kitchen cabinets, exterior siding.	4′ (also in 12″, 16″ and 24″ siding)	8′	3/8″, 1/2″ 5/8″, 3/4″
Hardboard-Faced Plywood	Combines smooth, paintable hardboard face with strengh of plywood backing for cabinet doors, counter tops.	4′	8′	1/2″, 5/8″ 3/4″
Natural Finish N-N, N-D*	Special cabinet-grade panels for high-grade natural or stained finishes. N-N has two sides of select, all-heartwood veneer where both will show; N-D, one select side. In interior only.	4′	8′	N-N: 3/4″ N-D: 1/4″
Boat-Hull Grade	Exterior-type plywood with a special inner-ply construction for marine uses.	Standard sizes and special large sizes to order		

*Grade names established by the Douglas Fir Plywood Association

Facts you should know

CAREFUL shopping will enable you to suit the wood you buy to the job you intend it for. Woods have widely different characteristics.

Woods like redwood and cypress stand up well and are easy to work. But they are too soft to take a fine finish. Birch and maple finish beautifully, but aren't easy to work without power tools. They also are more susceptible to moisture damage and decay. The chart at right helps you choose the woods that have the qualities you need for each job.

Woods that sand smooth and take a high, hard finish are listed as "good." Those that require more work and take softer, duller finishes are listed as "medium" or "poor."

Strength won't matter much in woods used for paneling, or supported by a framework, but can be very important in structural woods or furniture parts such as table legs. Density (hardness) can be roughly translated into "dentability." In general the hardest woods make the best cabinets and table tops.

The chart on page B12 shows how woods stand up under age and weather. Only those with "very high" decay resistance should be used unpainted outdoors. But many lower-rated woods will last well if treated or painted.

Woods with high shrinkage are not necessarily a bad choice if you make sure they are dry. "Checking" (small cracks) and "cupping" (warping) are defects found in woods exposed to weather. How much a wood cups or checks helps determine its suitability for exterior uses, as in house siding.

WOOD	COLOR
ASH, white	grayish brown
BALSA	creamy white
BASSWOOD	creamy white
BEECH	light brown
BIRCH	reddish brown
BUTTERNUT	light brown
CEDAR, red	red
CHERRY	reddish brown
CHESTNUT	grayish brown
COTTONWOOD	grayish white
CYPRESS	yellowish brown
ELM	grayish brown
FIR, Douglas	orange brown
FIR, white	off white
GUM	reddish brown
HICKORY	reddish brown
MAGNOLIA	yellowish brown
MAHOGANY, Honduras	reddish brown
MAHOGANY, Philippine	reddish brown
MAPLE, hard	light reddish brown
MAPLE, soft	reddish brown
OAK, red	flesh brown
OAK, white	grayish brown
PINE, eastern white	cream to brown
PINE, ponderosa	orange to brown
PINE, sugar	creamy brown
PINE, yellow	orange to brown
POPLAR	yellowish brown
REDWOOD	deep reddish brown
SPRUCE	off white
SYCAMORE	flesh brown
WALNUT	dark brown
WILLOW	brown

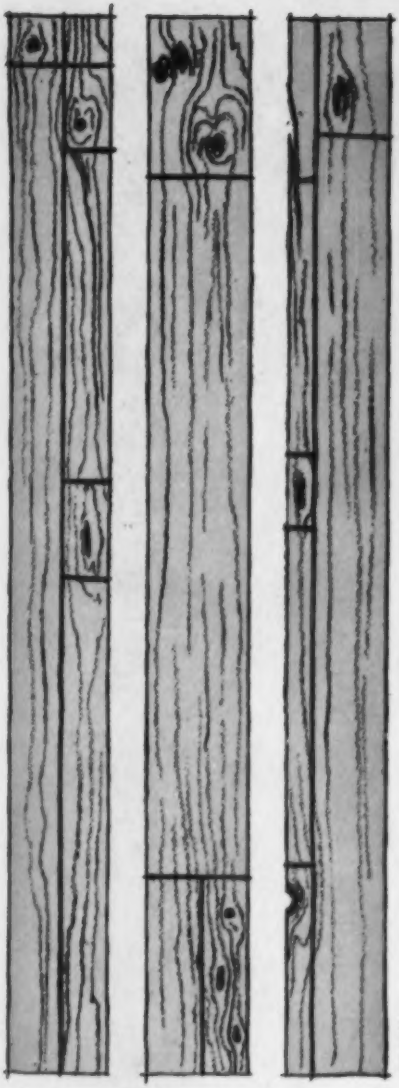
on WOOD PROPERTIES

STRENGTH	WEIGHT	DENSITY	EASE OF WORKING WITH HAND TOOLS	RESISTANCE TO NAIL SPLITTING	BASE FOR FINISHING	COST	WOOD
high	heavy	hard	hard	poor	medium	medium	ASH, white
low	light	soft	easy	good	poor	medium	BALSA
low	light	soft	easy	good	poor	medium	BASSWOOD
high	heavy	hard	hard	poor	good	medium	BEECH
high	heavy	hard	hard	poor	good	high	BIRCH
low	light	soft	easy	good	medium	medium	BUTTERNUT
medium	medium	medium	easy	poor	good	medium	CEDAR, red
high	medium	hard	hard	poor	good	high	CHERRY
medium	light	medium	easy	medium	poor	medium	CHESTNUT
low	light	soft	medium	good	poor	low	COTTONWOOD
medium	medium	soft	medium	good	poor	medium	CYPRESS
medium	medium	medium	hard	poor	medium	medium	ELM
medium	medium	soft	hard	medium	poor	medium	FIR, Douglas
low	light	soft	medium	poor	poor	low	FIR, white
medium	medium	medium	medium	medium	medium	medium	GUM
high	heavy	hard	hard	poor	good	medium	HICKORY
medium	medium	medium	medium	medium	good	medium	MAGNOLIA
medium	medium	medium	easy	good	medium	high	MAHOGANY, Honduras
medium	medium	medium	easy	good	medium	medium	MAHOGANY, Philippine
high	heavy	hard	hard	poor	good	high	MAPLE, hard
high	medium	hard	hard	poor	good	medium	MAPLE, soft
high	heavy	hard	hard	medium	medium	medium	OAK, red
high	heavy	hard	hard	medium	medium	high	OAK, white
low	light	soft	easy	good	medium	medium	PINE, eastern white
low	light	soft	easy	good	medium	medium	PINE, ponderosa
low	light	soft	easy	good	poor	medium	PINE, sugar
high	medium	medium	hard	poor	medium	medium	PINE, yellow
low	medium	soft	easy	good	good	medium	POPLAR
medium	light	soft	medium	good	poor	medium	REDWOOD
low	light	soft	medium	medium	medium	medium	SPRUCE
medium	medium	medium	medium	good	good	medium	SYCAMORE
high	heavy	hard	medium	medium	medium	high	WALNUT
low	light	soft	easy	good	medium	low	WILLOW

How woods weather

WOOD	RESISTANCE TO DECAY	AMOUNT OF SHRINKAGE	CHANGES DUE TO WEATHERING: COLOR BECOMES	CHECKING	CUPPING	WOOD
ASH, white	low	medium	dark gray	conspicuous	very high	ASH, white
ASPEN	low	medium high	light gray	inconspicuous	medium	ASPEN
BASSWOOD	low	high	light gray	conspicuous	medium	BASSWOOD
BIRCH	low	medium high	light gray	conspicuous	very high	BIRCH
CEDAR, red	very high	low	dark gray	inconspicuous	low	CEDAR, red
CHESTNUT	high	medium	dark gray	conspicuous	high	CHESTNUT
COTTONWOOD	low	medium high	light gray	conspicuous	very high	COTTONWOOD
CYPRESS	very high	medium low	silvery gray	inconspicuous	low	CYPRESS
FIR, Douglas	medium	medium	dark gray	conspicuous	medium	FIR, Douglas
FIR, white	low	medium	dark gray	conspicuous	medium	FIR, white
GUM	medium	medium	light gray	conspicuous	very high	GUM
HEMLOCK, eastern	low	medium	light gray	conspicuous	medium	HEMLOCK, eastern
HEMLOCK, western	low	medium	light gray	conspicuous	medium	HEMLOCK, western
HICKORY	low	high	light gray	conspicuous	very high	HICKORY
LARCH	medium	medium high	dark gray	conspicuous	medium	LARCH
MAPLE	low	high	light gray	conspicuous	very high	MAPLE
OAK, red	low	medium high	dark gray	conspicuous	very high	OAK, red
OAK, white	high	medium low	dark gray	conspicuous	very high	OAK, white
PINE, eastern white	medium	low	light gray	conspicuous	medium	PINE, eastern white
PINE, ponderosa	low	medium low	light gray	conspicuous	medium	PINE, ponderosa
PINE, sugar	medium	low	light gray	conspicuous	medium	PINE, sugar
PINE, western white	medium	medium high	light gray	conspicuous	medium	PINE, western white
PINE, yellow	medium	medium high	dark gray	conspicuous	medium	PINE, yellow
POPLAR	low	medium	light gray	inconspicuous	high	POPLAR
REDWOOD	very high	medium low	dark gray	inconspicuous	low	REDWOOD
SPRUCE	low	medium	light gray	conspicuous	medium	SPRUCE
WALNUT	high	medium	dark gray	conspicuous	high	WALNUT

Low-cost lumber



THOUSANDS of dollars are wasted every year by people who buy the most expensive grade of clear lumber, and then cut it into little pieces. For small projects, you can get such pieces at half the price.

The secret is to ask for factory- or shop-grade lumber. It isn't pretty. It's full of knots, splits and other defects. But by cutting out the defects you come up with clear wood that's often just as fine as a finish grade.

Shop-grade lumber is a good bet, too, for rough work, such as cellar storage shelves, where the defects don't matter or won't show. It will pay you to find a yard that carries this grade.

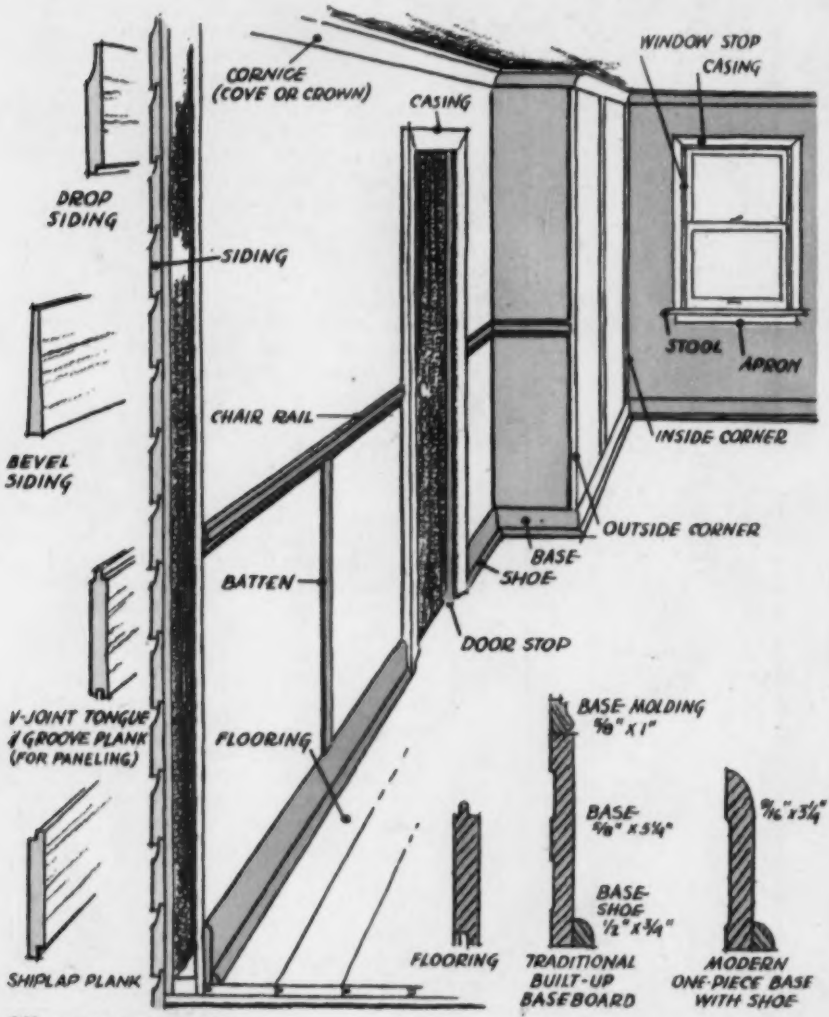
Wood is where you find it. Sorting out your own "cull" lumber, which many yards also stock, is another way to save money. This is low-grade stock, usually not squared at the ends, with splits, warps, twists and other defects. By picking out the best pieces and trimming them square, you can salvage wood for many uses where appearance or strength isn't critical.

Small pieces of high-grade wood, particularly hardwoods, may also be available at little cost as "mill ends" from lumberyards that do millwork. For larger pieces of hardwood, your own attic or a Salvation Army Depot may be a gold mine of old bed headboards, chests or table leaves.

Don't overlook those old fruit crates, either. The ends are usually ¾" soft pine, and the sides will give you thin stock from ¼" to ½" thick.

SAW OUT KNOTS and other imperfections as at left and you will have short pieces of high-grade wood for small projects.

Facts about many types



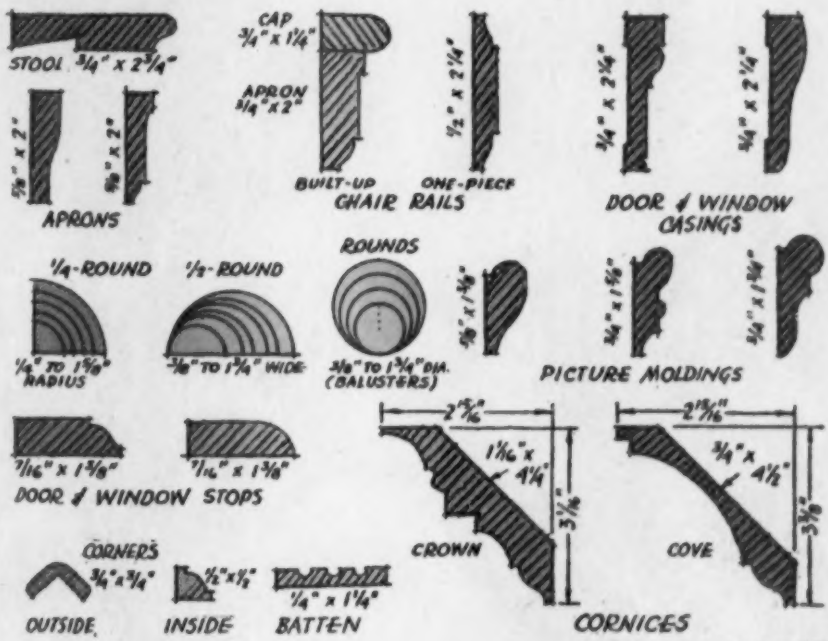
# of MILLED LUMBER

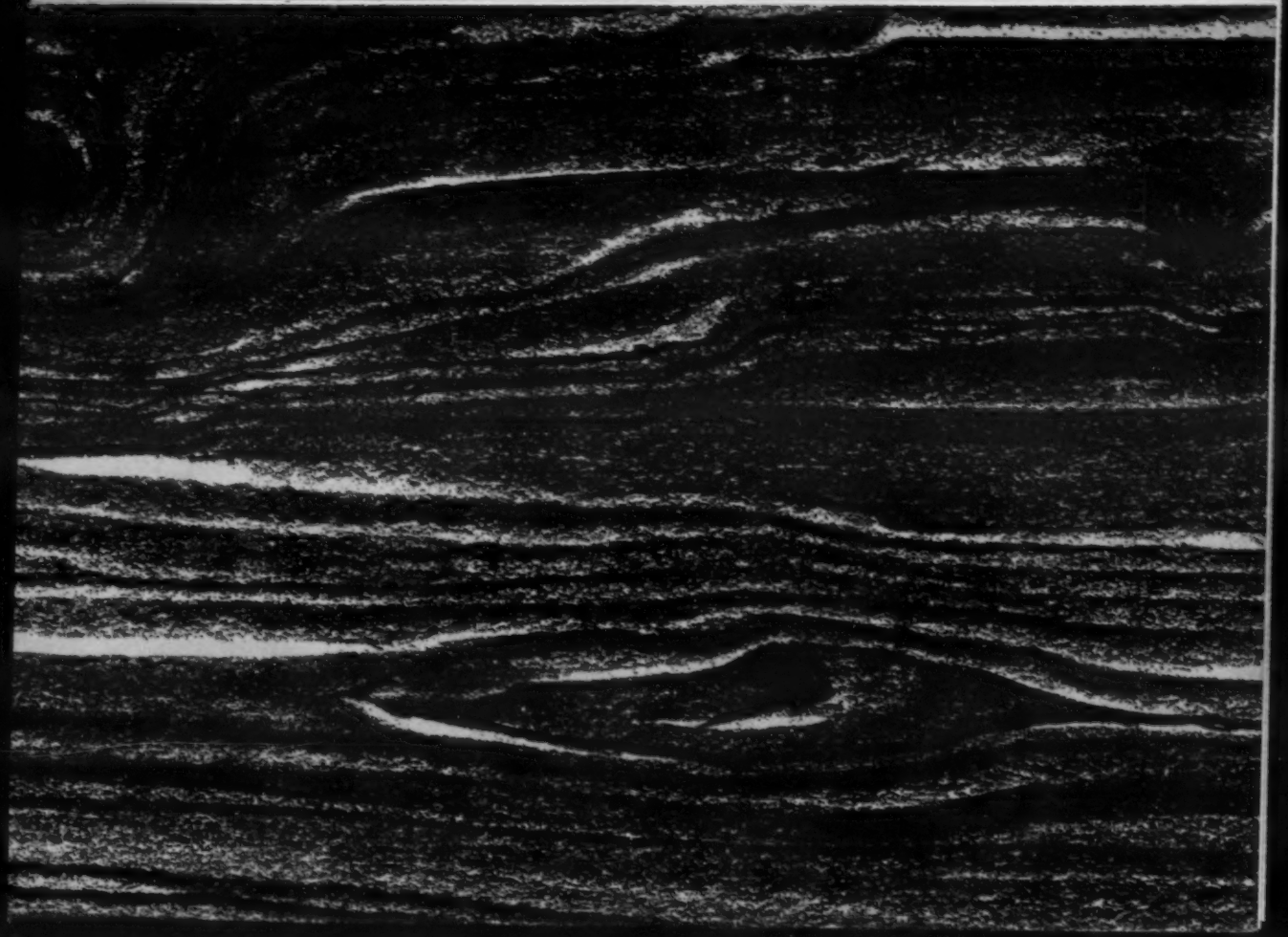
MOLDINGS are easy to use because they come in standard types, each one for a specific job. Each style and size is numbered so that you can match it exactly if you need to order more later. Moldings are sold by actual sizes and are priced by the lineal, or running, foot.

Paneling and siding are boards edge-milled to produce tongue-and-groove or shiplap joints. Bevel siding is made by resawing a single board slantwise to produce two tapered pieces.

The nominal width of tongue-and-groove stock includes the tongue, which can't be counted when figuring the quantity you need. To allow for this, plus waste, buy one-third more.

Hardwood flooring such as oak and maple is sold by actual dimensions that do not include the tongue. It's usually 2¼" wide across the face and 25/32" thick. Softwood flooring such as fir, pine and larch is sold nominally 1" thick and 3" or 4" wide. Both types come in either flat or vertical grain.





Here's a quick and easy way to build a—

Hi-Fi Speaker Enclosure

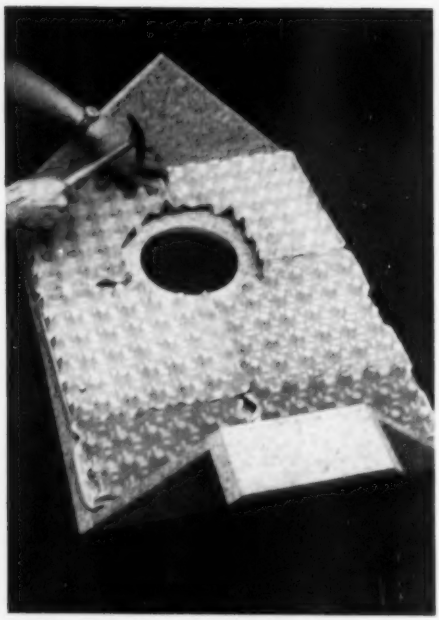
WANT hi-fi quality in a speaker enclosure with a minimum amount of cabinetwork and expense? You can build this one in an evening, using less than three dollars' worth of materials. The wall corner becomes an integral part of the sound box for an 8″ speaker.

The enclosure is a bass-reflex type. Dimensions, including those of the vent neck, have been carefully computed to give the best acoustical results. So stay with them.

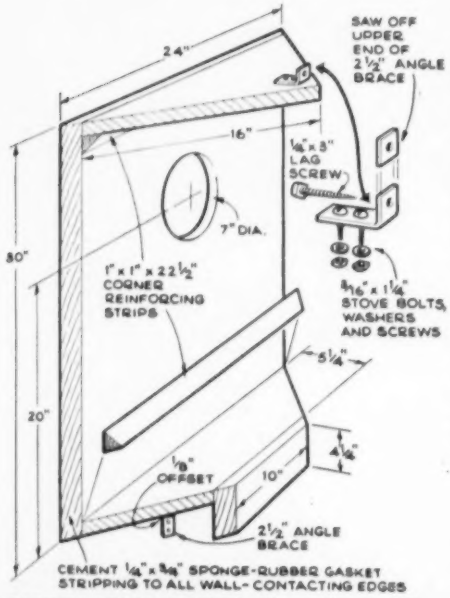
Start by cutting the front, top, bottom and vent neck from ¾″ particle board (I used Novoply). Jigsaw a 7″-diameter speaker opening centered 20″ above the bottom of the front panel.

Great strength is not a must in this wall-supported enclosure, so it isn't necessary to use woodscrews for the assembly. Instead, use one of the new, quick-setting thermoplastic glues and 6-penny finishing nails. Reinforce the top and bottom joints with glue strips.

Tack two thicknesses of molded pulp-board egg cartons to all inside surfaces of the enclosure except the vent neck. Crush each bump slightly to



CHEAPER THAN GLASS FIBERS OR FELT, pulpboard egg-crate trays tacked to the inside reduce resonance just as effectively. Wall sections behind the enclosure need no lining.



PARTICLE BOARD IS BEST for the enclosure. (Plywood could be used, but it has less satisfactory sound-damping characteristics.) Assemble the enclosure parts with glue and brads.

make these damping surfaces as uneven as possible. For good sound, too, the enclosure must fit snugly against the room walls. To insure a tight air seal, face all wall-contacting edges of the particle board with gaskets made from sponge-rubber weatherstripping. You can get this at an auto-supply store. You'll need 10′ of the ¼″-by-⅜″ size, or 19′ (using two widths) of the more commonly stocked ⅜″ width. Attach the gasketing to the enclosure edges with a beading of rubber cement.

For wall supports use three 2½″ angle braces. Place them as shown in the drawing, using stove bolts to attach the upper one to the enclosure top, and woodscrews for the two lower ones. As the sketch indicates, part of the upper bracket is sawed off and the remaining screw hole should be reamed to ¼″ diameter to take a lag screw.

Tack grille cloth across the back of the speaker opening and mount the cone. Attach the speaker leads, which can be either threaded out through the vent or concealed in the wall. Then prop the enclosure in position in the wall corner, preferably at a height that places the speaker opening about 5′ from the floor. Spot hole locations on the wall through the screw holes in the angle braces.

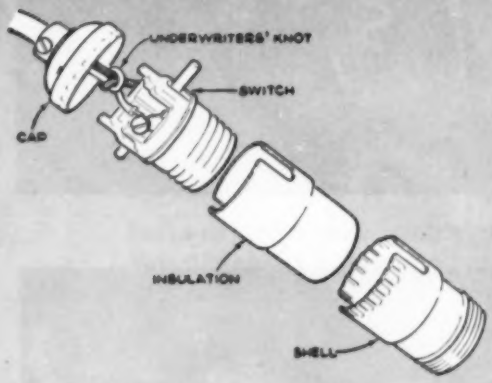
If the walls are of wood, bore pilot holes for a lag screw at the top and flathead woodscrews at the bottom. On plaster walls use a lag screw at the top and screw anchors at the bottom. Either way, mount the enclosure by first driving the lag screw loosely, then fastening the lower braces tightly to the wall, and finally drawing up the lag screw. Check the gasketing gingerly with a thin putty knife, to be sure it's tight all around.—*Tom Stevenson, Los Angeles.*

Save this reference sheet to use as a guide the next time you have a lamp cord to repair. It's one of a series of handyman aids that you'll find each month in POPULAR SCIENCE.

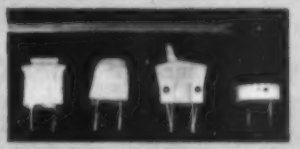
Next month: toilet tanks.

Popular Science Fix-It File

THE PARTS OF A STANDARD SOCKET



STANDARD PLUGS: Using these, you must bare ends of the wire.



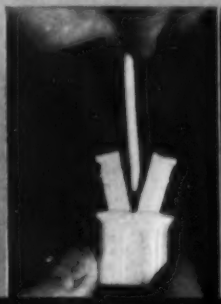
SNAP-ON PLUGS make contact without any need to strip wire.

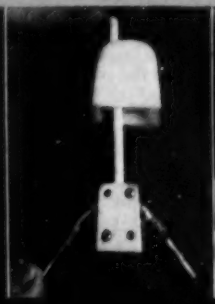
How to wire a standard plug

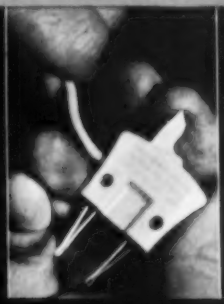
SEPARATE WIRES for about 3" by removing braid or splitting covering. Run cord through back of plug and tie an underwriter's knot (see other side of data sheet). With knife at angle to avoid cutting strands, bare ½" of wire and twist the frayed ends. Pull cord to draw knot into plug hollow. Run each wire around a plug prong and twist around post clockwise so that the wire doesn't loosen when you tighten the screws.

How to wire snap-on plugs

PRINCIPLE IS SAME in all types. You insert No. 18 flat cord into plug without baring insulation. Either closing plug or pushing a lever forces plug contacts through insulation to wires. Types shown (l. to r.) make connections when cap is pressed back over jaws; when prongs are squeezed parallel and cap replaced; when cord is bottomed in hole at side of plug and lever depressed; when cap is screwed down over knives.

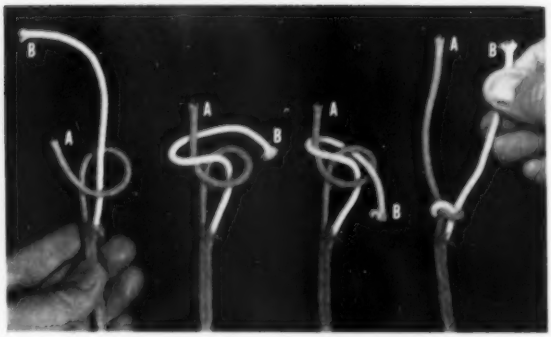






Underwriter's knot ties easily

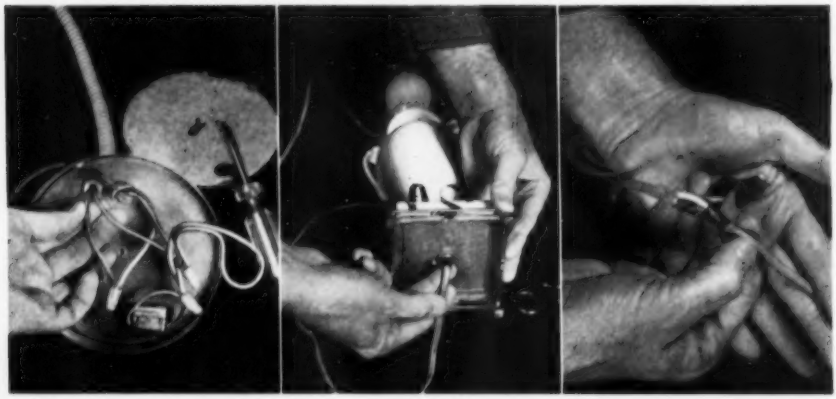
LOOP WIRE "A" around wire "B" and back across itself. Swing the end of "B" around "A" and back of the loop. Thread the end of "B" back through the loop in "A". Draw knot tight. Knot takes strain off connections.



How to wire a lamp socket

SEPARATE CAP from shell by pressing screwdriver against shell, either beside switch cutout, release slit or marked point on some shells. Thread cord through cap. Tie Underwriter's knot. Secure bared wire ends clockwise to binding posts. Reassemble the socket.

How to replace or repair lamp cords



TO RUN NEW CORD through a lamp, remove base or base felt for convenience while threading cord. On a lamp with base switch, note hookup with solderless connectors before disassembling.

PROTECT THE CORD against wear by taping it at the stress point where it enters the lamp base. For the neatest and strongest job, cut the tape into ¼"-wide strips before applying it.

MEND FRAYED SPOTS in an old cord with tape. Plastic electrician's tape is best for this purpose. Wrap each of the wires separately, if they show signs of wear, before taping up the entire cord.

Planning to buy a home? The good points are easy to see, but you have to look hard to find the bad ones. Here are—

63 Tests to Rate Your Next House

By Carl Dreher

Is it a dream house—or a nightmare? Use this checklist to make a record of faults you can spot. If you can answer "No" to most of them, you may have a good buy; if you can't, you'd better keep on looking.

LOCATION AND GROUNDS

1 POOR DRAINAGE? YES ☐ NO ☐

A house below street level or one where the ground slopes toward it is likely to take water in the cellar. For best drainage, the ground should slope away from the house.

2 ROCKY GROUND? YES ☐ NO ☐

A high, rocky site can be as bad as a low one if there is a serious chance of injury to children.

3 FILLED LAND? YES ☐ NO ☐

Freshly "made" land, such as a filled-in swamp, may cause uneven settling of a house, resulting in cracked plaster, sticking doors and other troubles. Special piles or "spread" footings can prevent this, and a house may be a good buy if you can be sure from blueprints or a building inspector that such precautions have been taken.

4 STEEP DRIVEWAY? YES ☐ NO ☐

This can be a nuisance in snow or ice, but more serious is the danger of accident when you back out. A driveway that slopes toward the house may also channel water into the cellar.

5 FEW TREES? YES ☐ NO ☐

Aside from poor appearance, you'll miss their shade, especially on the sun-beaten south and west sides of a house.

6 HEAVY TRAFFIC? YES ☐ NO ☐

Stay away from highways and heavily traveled town roads if you want a clean, quiet, safe location for children to play.

FOUNDATION AND CELLAR

7 CRACKS IN WALLS? YES ☐ NO ☐

Thin cracks and open mortar joints in foundation walls are easily patched, but long, deep cracks indicate uneven settling. In a new house, they spell more trouble to come.

8 UNFILLED CORE HOLES? YES ☐ NO ☐

A concrete-block foundation should have a top course of solid blocks or two top courses of regular blocks with the core holes filled with concrete. Check this with the salesman, builder or local inspector.

9 FLOODED CELLAR? YES ☐ NO ☐

A small puddle after a hurricane is not a fault, but if there's much water when

you inspect the house, it's sure to come back when you buy it. If the cellar is dry, look for water marks on the walls that indicate previous flooding. On a warm, humid day water may collect on cold cellar walls. This is condensation, not seepage, and is not a fault.

10 SUMP PUMP? YES ☐ NO ☐

This is frank admission that a water problem exists. The pump may be able to handle it, but it may also fail you when you need it most if there's a power shutdown during a storm.

11 WEAKENED JOISTS? YES ☐ NO ☐

Check rotted-looking areas with a jackknife. An occasional soft spot in old joists is all right, but if the blade penetrates an inch or two, the member will have to be replaced. If many joists are affected, you'd better not buy.

12 JACK POSTS? YES ☐ NO ☐

Some old houses have adjustable jack posts to shore up sagging joists. These are legitimate in small areas to help support heavy furniture or appliances, but not if needed to brace the entire floor.

13 SPLICED GIRDERS? YES ☐ NO ☐

Girder ends should butt on posts or walls, and nowhere else. Unsupported splice joints may eventually give way.

14 INFERIOR COLUMNS? YES ☐ NO ☐

Wood posts are not as strong as iron "lally" columns, but are acceptable if sound and made of solid timbers to avoid buckling. (The reverse is true of girders, which are strongest when built-up.) Watch, too, for posts that are sunk directly into concrete—they'll rot at the base.

15 ANY EVIDENCE OF TERMITES? YES ☐ NO ☐

Small, flattened tubes about the size of a lead pencil running along walls and in other places are a sure tip-off. But often termites are hidden in the wood and can't be seen. Jab spongy spots with a knife; see if they're hollow. Avoid houses that are damp, have cracks and openings in the foundation, or are littered with scrapwood. A termite-infested house may not be a bad buy if the seller is willing to cut the price enough to allow for repairs.

16 LOW CEILING? YES ☐ NO ☐

If you can't stand comfortably erect, you'll have to forget that basement workshop or playroom.

17 INACCESSIBLE CRAWL SPACES? YES ☐ NO ☐

Unexcavated areas must be 30″ high or more to move around in easily for inspection and repairs. Cramped, damp, unheated and trash-littered spaces promote rot.

18 ABSENCE OF CELLAR? YES ☐ NO ☐

This is not a structural fault since many fine homes are built on slabs. But it may represent an important loss in extra work, play or storage space in a small house.

EXTERIOR WALLS

19 WOOD TOO CLOSE TO GROUND? YES ☐ NO ☐

You should be able to see 4″ to 6″ of masonry foundation all around the house. Wood close to or touching the ground provides an easy entrance for termites.

20 NEEDS PAINT? YES ☐ NO ☐

Paint that's worn but sound can be renewed, though at a price. You may have to figure on adding $300 to $600 or more to the cost of the house. Badly peeling paint is more serious because it may indicate that the walls are wet inside. If you can trace bad spots to definite leaks, these can be fixed; if you can't, the cause may be condensation—often incurable.

21 ROTTED SIDING? YES ☐ NO ☐

An occasional broken, warped or rotted shingle or clapboard is easily replaced. Widespread deterioration, if due to normal weathering, is not harmful, but will call for new siding, which is costly. Extensive rot in a recent house (20 years or younger) may be due to improper paint-

ing, inside moisture or other serious defects. Don't buy it.

22 ROTTED WINDOW SILLS AND TRIM? YES ☐ NO ☐

These can be replaced, but allow for their cost. Make sure, too, that they aren't sources of leaks.

23 GAPS AROUND CHIMNEY? YES ☐ NO ☐

Separation between an exterior chimney and the side of a house indicates that one or both are moving. If the gaps are small and the house is old, the movement has probably stopped and may not be serious. In a new house, they mean trouble.

24 BULGING OR CRACKED WALLS? YES ☐ NO ☐

Sight along the outside wall surfaces. You might accept a little unevenness in an old house, but not in a new one.

ROOF

25 WORN-OUT SHINGLES? YES ☐ NO ☐

If they look ragged, wrinkled, torn or curled, they're nearing the end of their life. Houses are successfully reroofed every 10 to 20 years, but you can figure on an extra $500 or more to have it done.

26 SAGGING ROOF RIDGE? YES ☐ NO ☐

This is a major structural fault, difficult to correct and a sign of future trouble.

27 COMPLICATED ROOF DESIGN? YES ☐ NO ☐

Simple roofs, either flat or pitched, cost the least to maintain. Aside from necessary changes in level and direction, avoid a roof that's cut up just to make it "cute."

28 ROTTED RAFTERS? YES ☐ NO ☐

Look inside the attic for signs of rot. A single rafter can be replaced or strengthened, but extensive damage indicates serious leaks or an inside moisture problem.

29 CORRODED GUTTERS AND DOWNSPOUTS? YES ☐ NO ☐

Rust spots and holes can usually be seen from the ground. If they indicate that replacement is necessary, you will pay up to $100 or so for galvanized, considerably more for copper or aluminum. Wood gutters are considered the best-looking, but in time may leak and need to be lined.

30 ABSENCE OF GUTTERS? YES ☐ NO ☐

This is no longer considered a fault in many modern homes if drainage is good and gravel drain beds are installed around the foundation. But if drainage is bad, you may have to add gutters and dry wells.

INTERIOR CONSTRUCTION

31 OPEN JOINTS IN TRIM? YES ☐ NO ☐

These are the result of green lumber that has shrunk as it dried. You can patch them up, but other wood that doesn't show may also be green.

32 HAMMER DENTS IN WOODWORK? YES ☐ NO ☐

A good carpenter hits the nail, not the wood. Slipshod workmanship here may be a tip-off to poor quality elsewhere.

33 STICKING DOORS AND WINDOWS? YES ☐ NO ☐

You may find these in any house after a long, wet period that has caused wood to swell. But serious jamming may indicate high shrinkage or uneven settling.

34 CRACKED PLASTER? YES ☐ NO ☐

Small cracks are not unusual. Long, deep ones are likely to be due to structural defects that will worsen with age.

35 WRINKLED WALLPAPER? YES ☐ NO ☐

Wrinkles in the corners of walls may indicate a bad papering job—or, more seriously, uneven settling of the two walls. Look for other signs of settling.

36 LOOSE OR BUCKLED WALLBOARD? YES ☐ NO ☐

Green lumber often causes nails to pop out, leaving wall panels loose. A renailing job, requiring retaping, replastering and repainting, will not be cheap.

37 WATER STAINS? YES ☐ NO ☐

These are signs of leaks, often coming from some distance away. An occasional

leak, if found and fixed, won't harm a sound house. But if the owner hasn't been able to find them, you may not either.

38 SLOPING OR SPONGY FLOORS? YES ☐ NO ☐

These are signs of settling, sagging or actual rot in a floor itself—all major construction faults. Don't buy.

ROOM ARRANGEMENT

39 BAD FLOOR PLAN? YES ☐ NO ☐

Avoid bedrooms strung in a series, so you have to pass through one to reach another, a bathroom too near to the living room, or a living room used as a passageway. If there's no separate dining room (a fault in an expensive house), make sure there's an adequate dining area.

40 SMALL ROOMS? YES ☐ NO ☐

Watch out for tricks used to make rooms look larger, such as a mirror across one wall. Bare rooms also look larger than furnished ones. Take actual measurements to be sure what you're getting.

41 NARROW HALLS? YES ☐ NO ☐

Hallways and stairs less than 31″ wide will make it hard to move furniture.

42 STEEP STAIRS? YES ☐ NO ☐

Stair risers should not exceed 8″, or climbing will be difficult and dangerous.

43 INADEQUATE STORAGE? YES ☐ NO ☐

One tiny closet to a room isn't enough. Double-width closets are now considered standard for most new homes.

44 LOW CEILINGS? YES ☐ NO ☐

Ceilings under 8′ high are undesirable except in old houses where you may settle for 7½′ but no less.

KITCHEN AND BATHROOM

45 LESS THAN TWO BATHROOMS? YES ☐ NO ☐

Once a luxury, a second bath is now considered a necessary convenience, especially for growing families. Even if you don't miss it, the next buyer may. Two-story houses should have at least one bath on each floor.

46 OLD-FASHIONED FIXTURES? YES ☐ NO ☐

These can be replaced, but will cost you $300 to $600 for a bath, up to $1,000 or more to remodel a kitchen. An old or faulty tile job may cost about $100 to replace. Sheet-metal shower stalls, while serviceable, are noisy, look tinny and are objectionable to many buyers.

47 POOR VENTILATION? YES ☐ NO ☐

A bathroom must have either a window or ventilating fan to get rid of moisture. An exhaust fan is also standard in today's kitchens, though not in older houses.

48 ABSORBENT WALLBOARDS? YES ☐ NO ☐

Soft wallboards quickly absorb moisture, grease and dirt if used in kitchens or bathrooms. Used anywhere, they are easily dented and do not stand up well.

49 SMALL RANGE OR REFRIGERATOR? YES ☐ NO ☐

Most people consider a 42″, four-burner range minimum size for family cooking. A refrigerator does not usually come with a house, but there should be space for at least a nine-cubic-foot size. If you're going to want a dishwasher, be sure there's a place for it.

50 POOR KITCHEN PLAN? YES ☐ NO ☐

Have your wife make some trial motions to be sure that sink, range, refrigerator and work space are conveniently arranged. Watch out for cabinets that are too high to reach easily and too many doorways that interrupt the work flow. Open-plan kitchens look modern, but let odors and grease spread to other rooms.

51 NOT ENOUGH COUNTERS AND CABINETS? YES ☐ NO ☐

You should have at least 7′ to 10′ of counter space, including cabinets underneath. Four good-size wall cabinets—two for foods and one each for dishes and glassware—are minimum.

52 INADEQUATE LIGHTING? YES ☐ NO ☐

The single overhead fixture is not enough, though it's still found in most homes. A well-illuminated kitchen has separate lights over sink and range, and may also have them under the cabinets.

HEATING, PLUMBING AND WIRING

53 OLD-FASHIONED FURNACE? YES ☐ NO ☐

In general, it's best to look for a modern oil- or gas-fired furnace with either forced-air or hot-water circulation. Old gravity-air systems, hand-fired coal furnaces and coal furnaces converted to oil may eventually give you trouble.

54 LOW CAPACITY? YES ☐ NO ☐

Even a modern system can be undersized for the house. Find out if it heats all rooms evenly and easily, particularly if there's a second floor. If you plan to add heat to an attic or other area, be sure the furnace has the extra capacity.

55 HIGH FUEL BILLS? YES ☐ NO ☐

A well insulated, average-size house (1,000 to 1,500 sq. ft.) may cost from $140 to $200 a year for oil, somewhat more for gas (except in natural-gas areas). Bills that run substantially higher warrant further checking.

56 WEAK DRAFT? YES ☐ NO ☐

Soot around a furnace or rumbling on a start-up are signs of a weak draft. You may have to install a blower to improve it.

57 NOT ENOUGH HOT WATER? YES ☐ NO ☐

The 30-gallon water heaters found in some homes usually aren't big enough. For an average family, you'll want an 80- to 100-gallon unit.

58 INADEQUATE INSULATION? YES ☐ NO ☐

New homes in cold climates should be fully insulated (walls and either ceilings or roof); older houses may not be, and their heating bills will tell how serious a fault this is. Insulation 1″ thick is not as effective as 2″ or 3″, but may be adequate. Loose fill-type insulation (the cheapest) is more likely to absorb moisture and deteriorate than batt or foil types that incorporate a moisture-vapor barrier. Ceiling insulation is fine if the attic is not to be heated; if it is, the insulation should be in the roof.

59 COLD WALLS? YES ☐ NO ☐

If you can feel a marked difference in temperature between an interior partition and an outside wall on a cold day, that's a tip-off to inadequate insulation. A house with cold walls will be uncomfortable even if you overheat it.

60 NO STORM WINDOWS OR WEATHERSTRIPPING? YES ☐ NO ☐

You can figure on several hundred dollars if you have to add these.

61 OLD PLUMBING? YES ☐ NO ☐

Iron pipe in an old house tends to clog and will eventually reduce water pressure seriously. Turn on the faucets, especially in second-story bathrooms, to test the pressure. If it's low, new plumbing will be expensive to install. In new homes, you should find copper plumbing.

62 NOT ENOUGH POWER? YES ☐ NO ☐

A 60-ampere circuit, with only four branch circuits, is not adequate for today's lighting and electrical needs. Don't settle for less than a 100-ampere circuit with eight branch circuits. Still better is a 150-ampere circuit with 12 lighting circuits and a number of high-amperage appliance circuits. (You can tell the number of branch circuits by the number of fuses in the fuse box.)

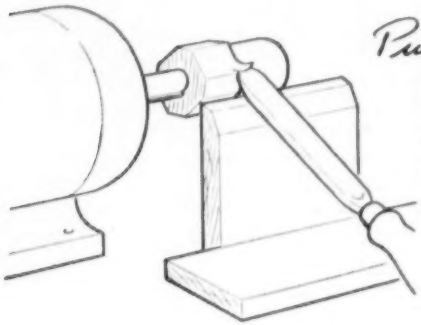
63 NOT ENOUGH OUTLETS? YES ☐ NO ☐

You should have one duplex outlet for every 6′ to 10′ of wall in living areas and every 4′ of counter space in the kitchen, with a separate outlet for the refrigerator. At least one outlet in every room should be controlled by a wall switch. END

PS Shop Notebook

Handy Polisher

Tools can be brightened in seconds if you keep a typewriter eraser with them. When they get dark or start corroding from moisture, just rub them with the eraser. The mild abrasive in the rubber scours tools clean. Clean the eraser on sandpaper occasionally.—*Phil McCafferty, Cedar Rapids, Iowa.*

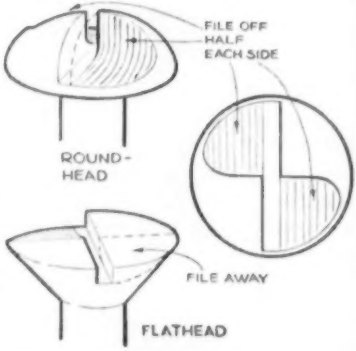


Pulleys Turned on Motor

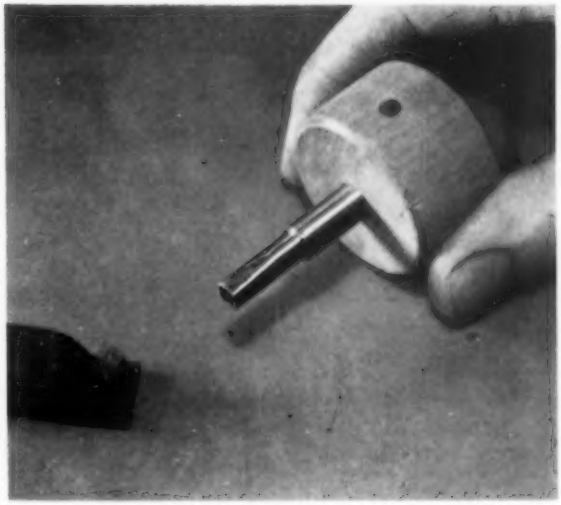
Pulleys that will serve for years can be made from wood. Bore a block of hardwood slightly undersize and drive it on the motor shaft—right over the keyway if there is one. With the tight fit you get, no setscrew is needed. Next, rig a temporary tool rest beside the motor; turn the pulley to size.—*C. Woodson, East Aurora, N. Y.*

HAVE YOU TRIED THIS?

Keep thieves from stealing car accessories, yard ornaments and other outdoor objects by filing the heads of their mounting screws so that they'll only turn *in*. File away two quarters of the screw head, leaving only the sides of the slot that will give a screwdriver purchase for tightening. Be sure you have everything in place before you drive the screw home—you'll have to drill it out to remove it.



Tubing Makes Key



Need a special key for the square shaft of an antique clock, an old piano lid or just a pair of roller skates? You can make any size by forging brass tubing over the tapered square tang of a file. Use tubing large enough for the size you're making, insert the file tang to the point where the taper is large enough, and hammer the tubing around it. If the key is too small, it can be stretched by driving the taper on into the square hole. If too large, continued hammering will compress the brass around the taper. Pin a knob or a handle on the key.

Fast Working Hex Wrenches

You can adapt hex wrenches to utilize the speedy action of a spiral-drive screwdriver. Make several steel shanks, filing an offset end and V notch to match those on the screwdriver's regular bits. Drill holes in their ends and solder short lengths of hex wrenches (or rod) in them.—*Frank Bernstein, Maspeth, N. Y.*

Tack Puller

File a V notch in one claw of a hammer for pulling tacks and brads. It won't interfere with the use of the claw for pulling nails, and its thin edge will easily get under small fastenings.—*G. Lynch, Asheville, N. C.*

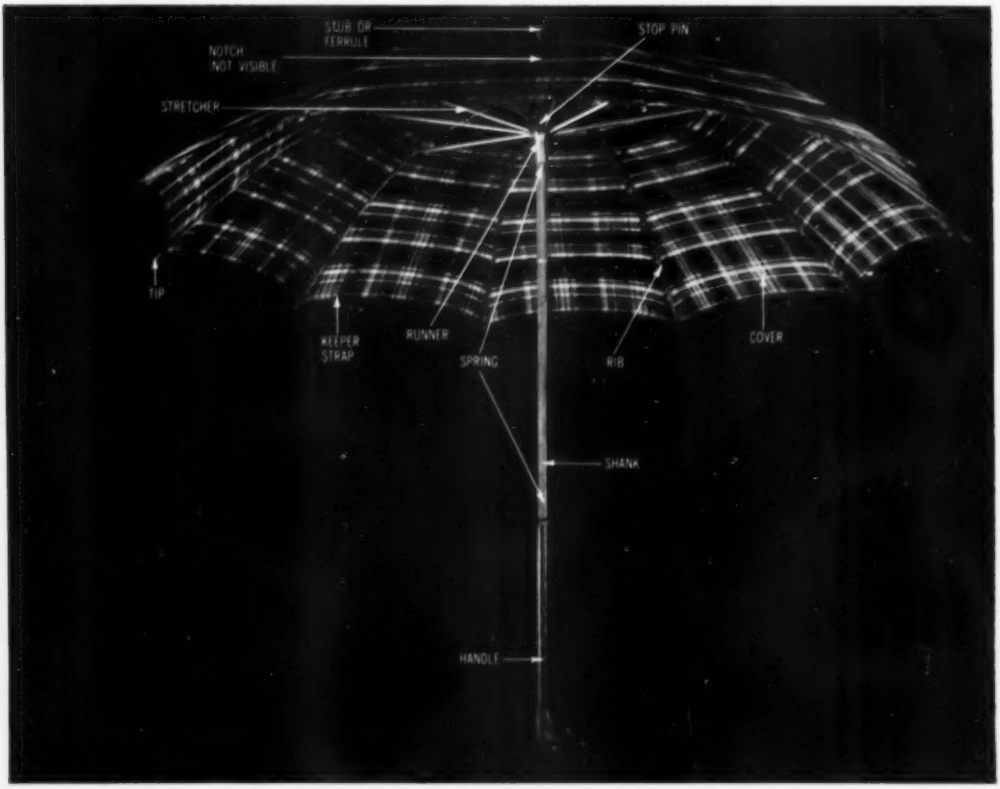
Here's one job you should NOT put off until a rainy day!

How to Repair an Umbrella

APRIL showers call for a reappraisal of the cripples in the old umbrella stand. It often takes no more than the fittings from one battered veteran to put another back in service. At worst, you may have to buy a few new parts. Many umbrella-repair shops sell them, and a back-in-business umbrella is well worth the few pennies they'll cost.

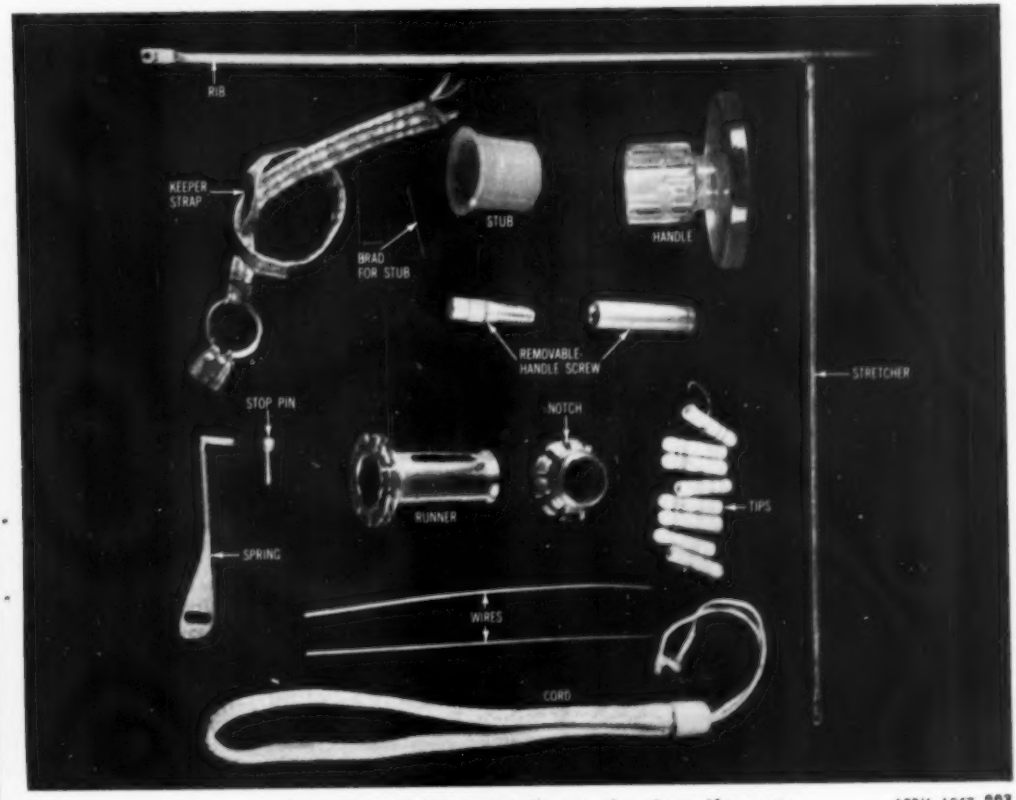
Other than applying a new cover—a chore best left to the experts—umbrella mending falls into two classes: rib repair and shank-and-handle repair. You can do this work with common hand tools. Look over the pictures of renovating jobs on these four pages and you'll wonder why you've put up with a beat-up bumbershoot so long.—*Darrell Huff.*

These parts make up an umbrella



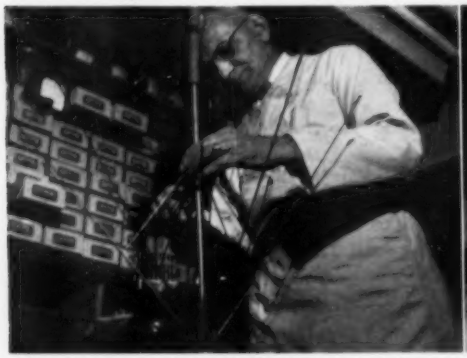
COVER SHRUNKEN? To restretch it, open the umbrella as far as possible and back up the runner with a clamp, as shown. Keeping the cover wet, advance the clamp at intervals until the runner snaps back over the upper spring. Don't try to hurry the job—it may take hours of intermittent attention to put such a bumbershoot back in working order. Next time, be sure the umbrella is dry before you close it.

.....*and these are typical replacement fittings*



For more about umbrella repairs, turn the page

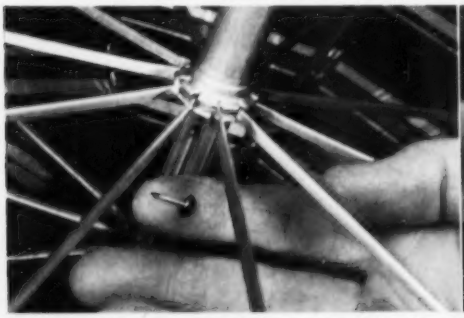
How to replace bent or broken ribs



1 TWO POINTS OF RIB-REPAIR WORK are demonstrated by a veteran renovator at the California Umbrella Works in San Francisco. Place the umbrella stub in a hole, for support, and work on it with the ribs half-open.

2 TO REMOVE DAMAGED RIBS, pull their tips loose and snip the loops of thread holding them to the cover. Untwist and remove the wire loops that attach the stretchers to the runner and the ribs to the umbrella-top notch.

Tips on shank and handle repairs



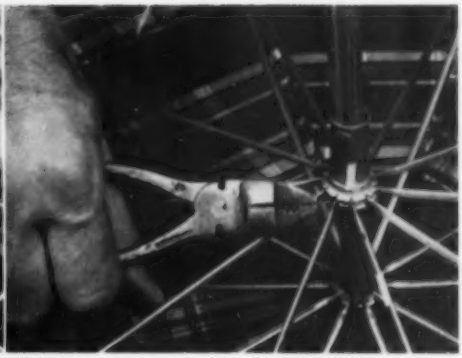
1 STOP PIN, above runner of an open umbrella, keeps rib assembly from turning inside-out when wind strikes from below. If the pin is lost or worn, you can fill the need with a large-headed nail or a roundhead wood screw.

2 TO REPLACE A SPRING on a wooden shank, drive its pointed end level with slot, and facing center of the shank. Then push a common pin through the shank and spring hole at "X". Clip off the pin and file it flush.

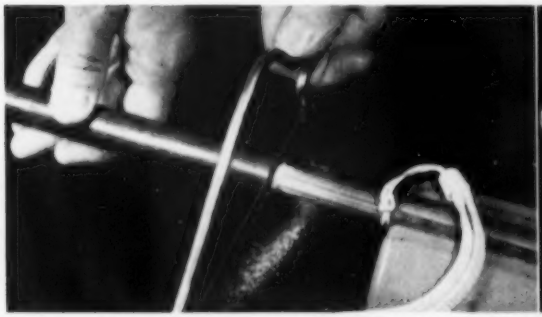
5 SUITCASE UMBRELLA can be made of a long-handled type with a removable-handle screw that you can buy at an umbrella-repair shop. First step: Saw off the handle, drill a hole in the shank, and glue in the male fitting.

6 SLEEVE SECTION of the handle screw is then cemented into hole drilled in the umbrella handle. Be sure that both this hole and the one in the shank are accurately centered. Handle may now be put on and taken off at will.

3 KEEPING RIBS IN ORDER, insert new ones where needed. Run a length of soft wire through the hole at the inner end of each rib and refasten it to the umbrella-top notch. Wire the stretcher holes in a similar manner.

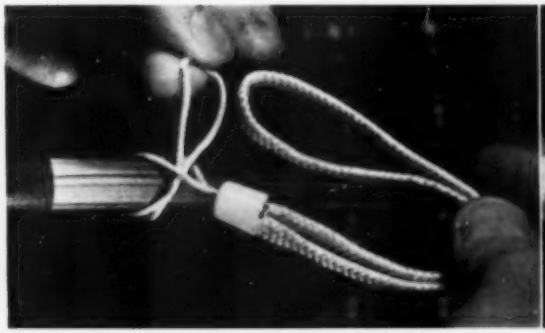


4 FASTENING at both notch and runner is completed by twisting wire ends together and cutting off the excess. Be sure runner slot and lower spring align. Restitch ribs to the hem of the cover with beeswax-coated thread.



3 REMOVE OLD UMBRELLA HANDLES by soaking them until they expand and loosen, or split carefully to avoid damaging the shank. To shorten a long-shanked umbrella for the "new look," saw through the shank, as shown.

4 BEFORE PUTTING ON A NEW HANDLE, shave down the shank if it is too large, or wrap the shank with thread or string if the fit is too loose. Either way, apply glue or household cement before driving the handle home.

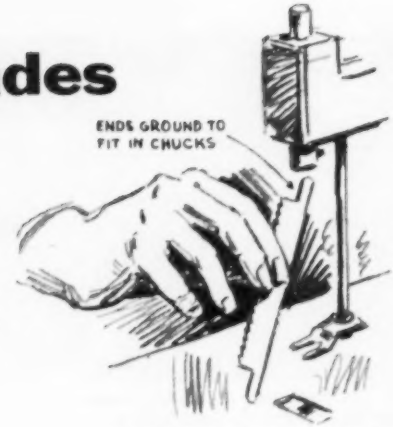


7 REPLACING CARRYING CORD that is lost or worn is simple. Wrap the small part of the cord around the shank and bring it back through itself. Then push the heavy cord through the small loop and pull it tight.

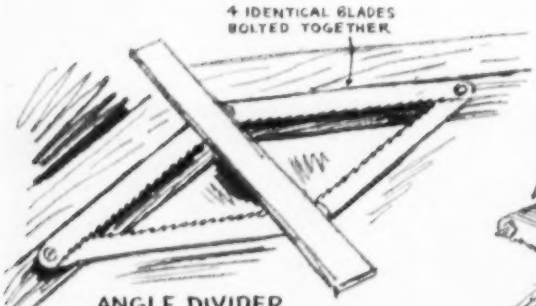
8 UMBRELLA STUBS TAKE A BEATING. If you put on a new one, make sure that it gets a snug fit against the fabric. Apply glue before driving it onto the top of the shank. The stub shown here is of the cane type. END

7 USES FOR Hacksaw Blades

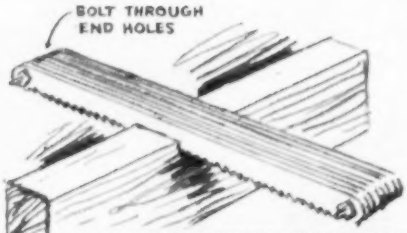
BINDER FOR MEMO PADS
ON WRITING BOARD. SHEETS TEAR OFF EASILY



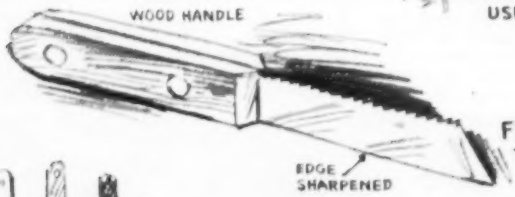
METAL-CUTTING JIGSAW BLADE USE ENDS OF BLADES WHERE TEETH ARE STILL SHARP



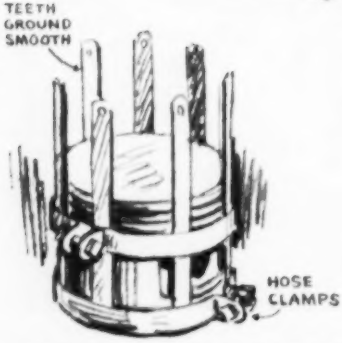
ANGLE DIVIDER
USE STRAIGHTEDGE TO BISECT ANGLE TO FIND MITER CUT



ADJUSTABLE-WIDTH WOOD RASP
USE IT FOR SURFACING WOOD OR CUTTING GROOVES

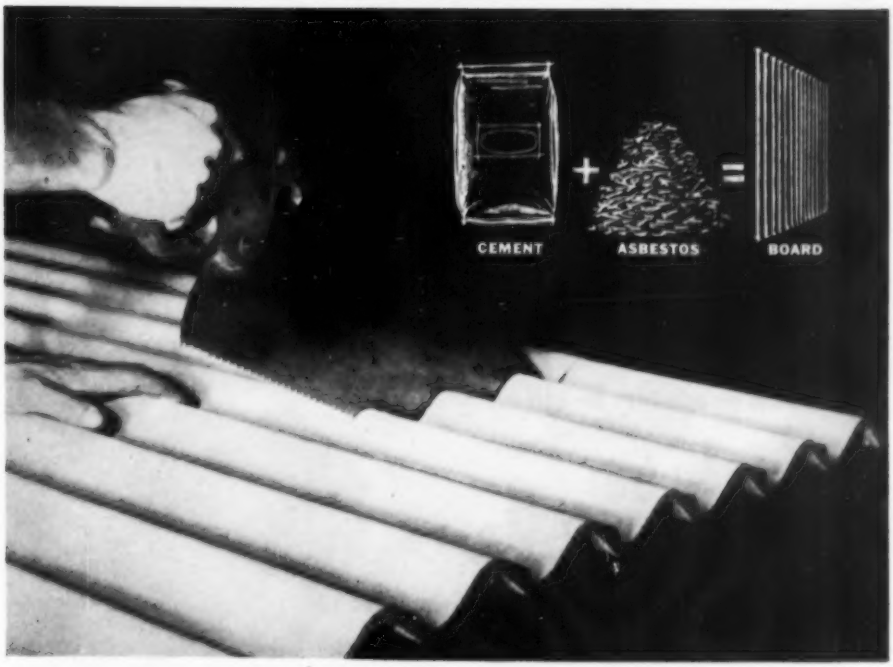


FISHING KNIFE
TOOTHED EDGE REMOVES FISH SCALES



PISTON-RING COMPRESSOR
BLADES HOLD RINGS IN GROOVES WHILE PISTON IS PUSHED INTO CYLINDER

GLUE SPREADER
TEETH DISTRIBUTE GLUE EVENLY



Here's how to use—

The Building Board That Won't Burn

By Darrell Huff

ASBESTOS and common cement are a couple of materials that almost nothing can harm.

Combine them so that the asbestos fibers reinforce the cement, form this mass into sheets under high pressure, and you have asbestos-cement board.

It's widely available now, and growing in popularity. If you haven't been using it around your house and shop, you may be missing a good bet.

Advantages. The board is inexpensively and remarkably hard-surfaced and durable.

It resists fire—ever try to burn asbestos or cement? Painted or unpainted, it stands up to weather.

You can get it flat or corrugated—and sometimes now in interesting ribbed and fluted decorative forms. The flat sheets come in both flexible and rigid types in thicknesses from ⅛″ to ⅜″.

The weatherproof nature of the board fits it for many outdoor uses. It makes outbuildings, fences, garden borders and patio roofs that need no paint.

For a cabin wall, it can be left unpainted (its natural color is soft gray). Where color is wanted, as for siding a house, it takes paint so smoothly that it is unusually quick and cheap to paint.

Because it won't burn, asbestos board

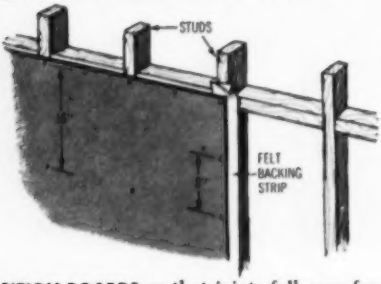
Three of the ways you can use asbestos-cement board

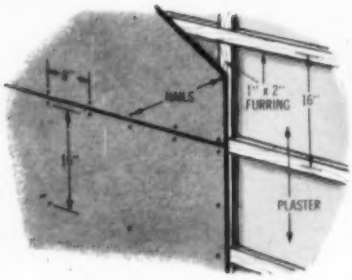
EXTERIOR WALLS

PATIO ROOF

FENCE

It goes on new walls or old





POSITION BOARDS so that joints fall over frame members. On new work, nail boards directly to studs, as above. When covering old plaster or masonry walls, nail boards over furring strips on 16" centers. Space nails 8" apart. On new exterior walls, back the joints with felt strip.

is a splendid wall material around fireplaces, behind stoves or in the part of your shop where welding is done. This same characteristic makes it useful for backing radio cabinets where there may be a good deal of heat. It is good for lining closets, laundries and garages; and for making laundry chutes, heating ducts and firewall partitions.

Disadvantages. The board has some drawbacks, too.

The corrugated type is more difficult to cut than most other building materials. So is the flat type—but where straight cuts are needed flat board may be scored and broken in a jiffy.

It is more brittle than many building materials, so it may be broken in handling. But once the board is up this is seldom a problem.

The ¼"-to-⅜" corrugated boards used for roofs are much heavier than corrugated aluminum—as much as five pounds to the square foot instead of about a half-pound. This means that framing has to be stouter too.

Choosing your board. In flat asbestos board, the thick and rigid sheets are mostly for industrial use. For light construction and jobs around the house you'll find the flexible varieties more useful and easier to buy. They come in ⅛", $\frac{3}{16}$" and ¼" thicknesses, under such descriptive trade names as Flexboard and Pliaboard.

Standard size is 4' by 8'. Sheets 4' by 4' and up to 4' by 12' are sometimes offered.

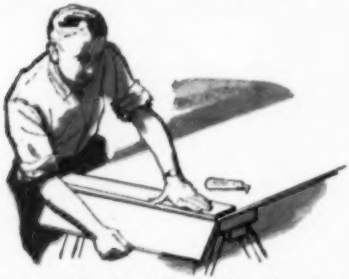
The corrugated type is usually 42" wide, with 10 corrugations to the sheet. Lengths may be anywhere from 2' to 12'. There's also a kind only 8" long. It is used to border flower beds and sidewalks and is called Garden Trim.

The fluted or ribbed decorative panels,

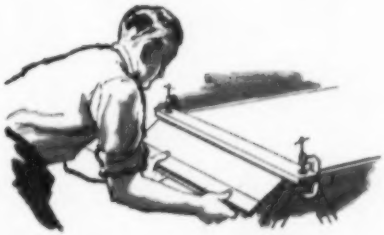
Scoring and breaking brings a flat board to size

MEASURE FOR CUT (on the smooth side), then place a straightedge or two-by-four along cutting line. Score deeply with knife or ice pick.

SLIDE THE PANEL DOWN so that the score overhangs the saw horse or work table. Line up the straightedge carefully with the scored line.

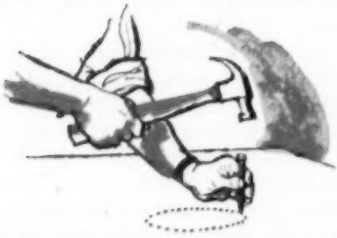


HOLD OR CLAMP the straightedge in position and press down sharply on the overhanging end. It will snap clean right at the score line.

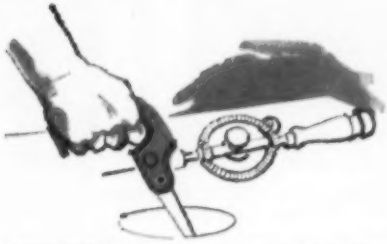


WHEN TRIMMING WIDE PANELS, hold a piece of two-by-four against the overhanging part to distribute the pressure when breaking it off.

You can punch out holes, or saw them by hand



FOR SMALL OPENINGS, punch a series of closely spaced holes and drive the piece out with a hammer. Smooth the edges with a coarse file.



LARGE OPENINGS are easily cut with a keyhole saw. Draw the shape of the opening you want, and drill a hole for starting the saw.

4′ by 8′s that are ¼″ thick, make interesting walls—inside and out.

How to cut it. With flat panels, scoring and breaking is quicker than cutting. Score the panel deeply with an ice pick, awl, file, linoleum knife or carbide-tipped scoring tool. Then snap off the extra portion. Smooth the edges with rasp, file or sandpaper.

Cut curves with a keyhole or coping saw, just as you would in plywood, first drilling a hole if it is a cutout. There's a special trick for making smaller openings: Punch a series of holes close together, then knock out the piece with a hammer. You can smooth the edges with a coarse file.

Asbestos panels, including corrugated, ribbed and fluted types, can be cut with an ordinary handsaw. A 10-point saw is best; wet it with water for faster cutting. For power cutting, use a rein-

Use the right nails for each cement-board job

NAIL	HEAD	1/8" BOARD	3/16" BOARD	1/4" BOARD	INTERIOR WALLS	EXTERIOR WALLS	CEILINGS
Common Wire	Flat	1¼"–14 Ga. (3 penny)	1½"–12½ Ga. (4 penny)	2½"–10¼ Ga. (8 penny)	Yes	Not Recom.	Yes
Galvanized Steel Roofing	Flat	1¼"–10 Ga. 1"–12 Ga.	1¼"–10 Ga. 1"–12 Ga.	1¼"–10 Ga. 1"–12 Ga.	Yes	Yes	Yes
Galvanized Steel Shingle	Flat	1½"–12 Ga.	1½"–12 Ga.	1½"–12 Ga.	Yes	Yes	Yes
Hard-Steel Noncorroding Screw Nail	Casing	1"–14 Ga.	1½"–14 Ga.	1½"–14 Ga.	Yes	Yes	Yes

PRE-DRILL FOR LARGER-SIZE NAILS, and they'll go in without damaging the asbestos board.

forced cutoff wheel (well guarded) or a carbide-tipped blade.

When a hole is needed, use a metal drill rather than one intended for wood. This stuff is pretty hard.

How to nail it. Apply asbestos-cement board according to the routines shown in the sketches. Pre-drilling is needed only for larger-size nails. Use a nail set to drive nails home in non-flat board.

While you can use either battened or V joints anywhere, battened joints are usually the better choice for exteriors. V joints are attractive for interior walls. Battens should be about 3" wide—either strips of asbestos board or standard 1"-by-3" wood battens.

Make the V joints by beveling the edges of the board before you nail it up. Bevel it about $\frac{1}{16}$" with a rasp or sandpaper.

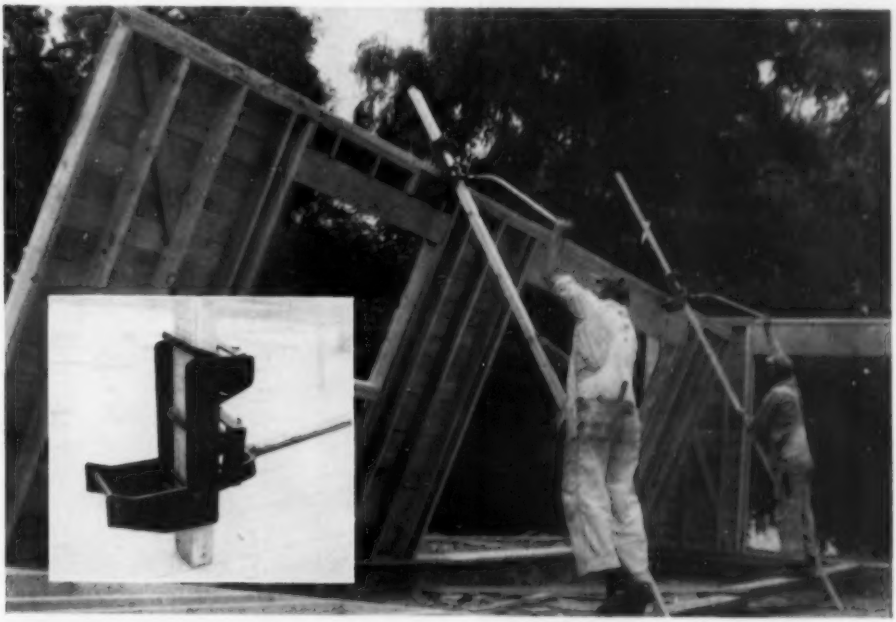
Nails should usually not be thicker than 11- or 12-gauge and should have needle points. They should be long enough to go about 1" into the wood. Use rustproof nails for exteriors and damp interiors; hot-dipped galvanized asbestos-shingle nails for general use.

How to paint it. One helpful thing about asbestos-cement board is that you can put it up now and paint it year-after-next—or never. You can clean it with a hose or scrub it with soap and water and a fiber brush. Or use household cleansers: Old Dutch, Oakite, Bab-O.

For dirt stains, try a strong solution of sodium hypochlorite or a two-percent solution of oxalic acid. Rinse thoroughly with clear water.

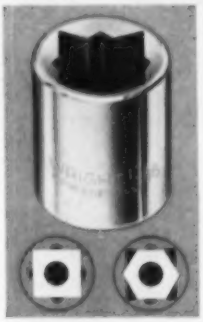
When you paint asbestos board it's to cover discolorations or simply to get color. Be sure the surface is clean and dry before you start painting. END

New Tools



1. Versatile Jack Is High Lifter. Climbing a length of two-by-four, this jack will raise a 1,000-lb. weight as high as the beam is long. Using two or more—alone if you haven't got a helper—you can up-end a pre-assembled wall and hold it steady while you nail it in place.

The jack is threaded between two gripping members onto the lower end of any dressed two-by-four, and its foot is placed under the load. It then "walks" the load up the beam as you pump its 30″ lever.



2. Dual Socket. Eight corners, spaced at 45°, enable this new socket to fit both hex and square nuts of the same size.

You can get a set of six in sizes from ½″ to $\frac{13}{16}$″, or a full set of 11 from ⅜″ to 1″ with a ½″-drive ratchet wrench.

3. Pocket Saw Has Flexible Blade. With a finger in each end ring of this new French-made saw, you can cut heavy wood, plastics or nonferrous metals, or you can string it on a bowed stick for use with one hand. Between jobs it tucks in a pocket like a coiled key chain.

It has an 18″ wire-like steel blade with nonclogging double-spiral teeth.

More information *about these new tools can be obtained from: 1. Home Service Co., 7788 Ninth Ave., S.W., Seattle 6; 2. Wright Tool & Forge Co., 42 E. State St., Barberton, Ohio; 3. Varco, 91 Broadway, Jersey City.*

New for the Handyman

1. Accordion-Fold Insulation. A 750′-strip of this aluminum laminate (1,000 sq. ft.) comes in a flat 3′ carton weighing 55 lb. You cut it to length, unfold and staple it between studs. Air spaces separate its multiple reflective surfaces. Smaller boxes can also be purchased.

2. Platform Tops Ladder. A 3′-by-3′ lightweight magnesium platform caps the end of any standard single or extension ladder to provide a firm working area. You can fit a hoist attachment to it to lift tools and materials to working height. The unit folds flat for transporting.

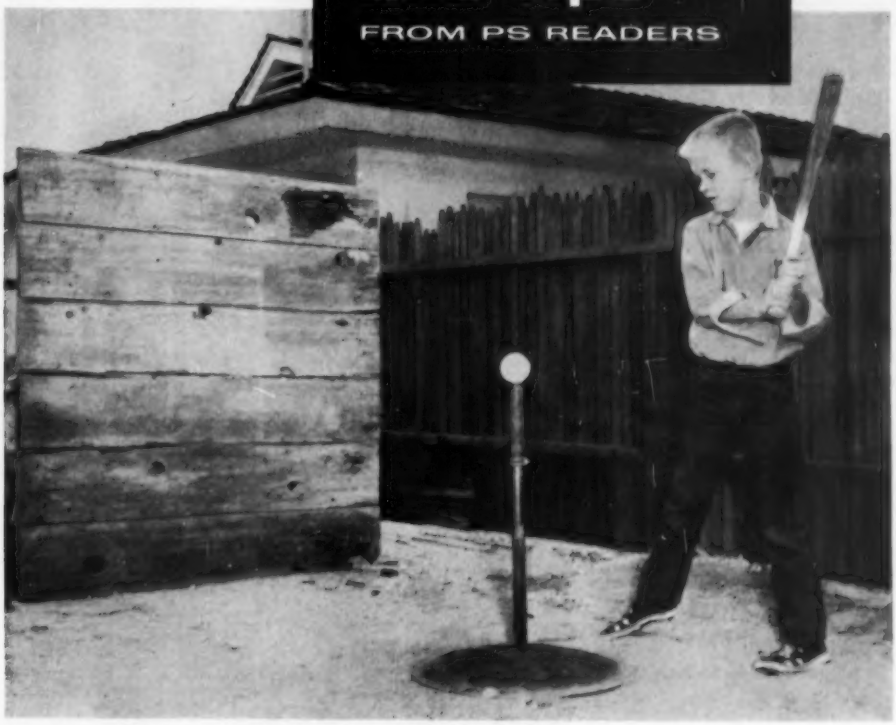
3. Do-It-Yourself Iron Railing. Ring joints, with bolt slots on three sides, are the key to assembling this railing. They come both as spacers and as end pieces on the vertical members. The slots allow adjustment to step pitch. Kits for various-length sections are available.

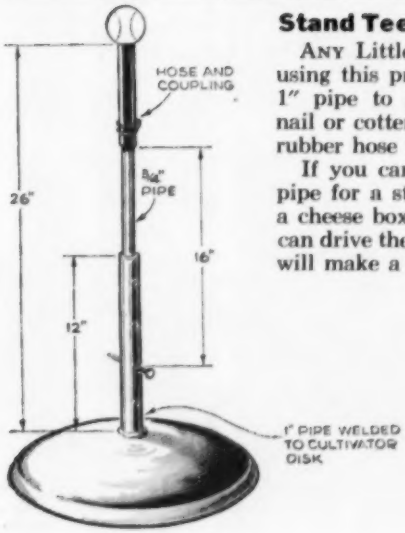
4. Sliding Door Is Ready to Hang. All you need do to install this door unit is put it into the wall opening, hang it to the rough header with two bolts, and nail the frame in. The parts—track, two sliding sections, finish header and frame—come completely assembled.

More information *about these products can be obtained from: 1. Infra Insulation, Inc., 525 Broadway, NYC; 2. Munson Co., Fenton, Mich.; 3. Hi-Compression Products Co., Washington, Iowa; 4. Stanley Works, New Britain, Conn.*

Short Cuts and Tips

FROM PS READERS





Stand Tees Up Ball for Batting Practice

ANY Little Leaguer can improve his batting average by using this practice setup. A length of 3/4" pipe slides in a 1" pipe to give tee-height adjustment. Drill both for a nail or cotter-pin stop. Top the tee by attaching a piece of rubber hose to the smaller pipe with a hose coupling.

If you can get an old cultivator disk, weld it to the 1" pipe for a stand, or sink the pipe in concrete poured into a cheese box. If there is no reason to move the setup, you can drive the pipe a foot into the ground. Any rough lumber will make a backstop.—*Hi Sibley, Nuevo, Calif.*

▶▶▶WHEN the treads on my basement stairs became a hazard because they were worn and slippery, I covered them with 1/4" hardboard laid down screen-side up for nonslip traction. I cut the hardboard to fit flush with the front of the treads and lightly beveled the edges of each strip with a file and sandblock before nailing it down.—*J. L. Rummel, Boston.*

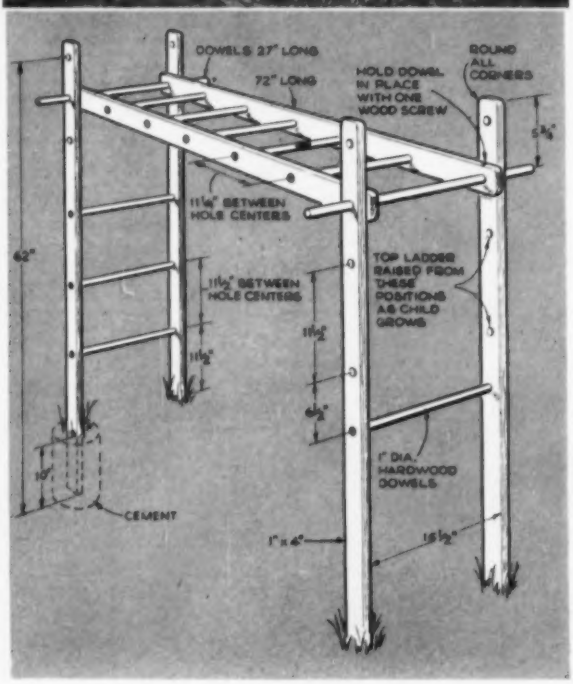
Short Cuts and Tips

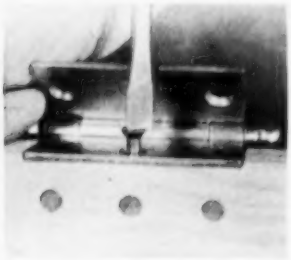
Back-Yard Gym Grows with Child

As THE child grows, so does this back-yard gym. Four holes drilled a few inches apart through each upright post let you pull out the end dowels and raise the cross ladder as the youngster increases in height.

When the crosspiece is raised to the highest level, new dowels are put in the lower holes so that the child can climb to the top easily.

Build the three sections of one-by-fours and 1″ hardwood dowels or, for a setup sturdy enough for a teenager, substitute two-by-fours and 1½″ dowels. Set the posts in concrete and give the gym two coats of outdoor paint.—*Phil McCafferty, Stanwood, Iowa.*





Dowels Anchor Hinge Screws

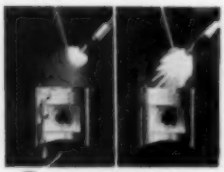
WHEN a hinge must be fastened to a plywood edge, drill ¼″ holes through the panel in the path of the screws and glue dowels into them to give the screws extra holding power.—*C. C. Cooley, New Buffalo, Mich.*

1 More road horsepower—You get all the engine power you paid for when you replace old plugs with 5-rib Champions! Independent tests proved new Champions give cars of all makes an *immediate* boost in the real power actually delivered at rear wheels. Most cars gained 6% to 31%—for better hill climb and safer passing. No wonder 9 out of 10 racing drivers insist on Champions!

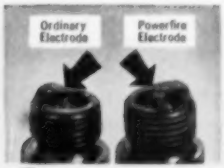
How Champion spark plugs can make your car 4 ways newer

If you haven't changed your plugs in about 10,000 miles, read why Champions will make a big difference in your car's performance

2 Quicker starts—You'll get quicker starts, too . . . save wear and tear on your battery. Tests with major makes of cars showed new 5-rib Champions cut starting time as much as 71%—with an average of 39%!



3 Less engine wear—You avoid costly repairs. Misfiring plugs (left) dilute your oil with raw gasoline. New full-firing Champions (right) protect the oil. *When changing oil—check your spark plugs!*

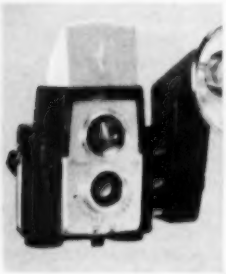


4 Lower cost per mile—You get top power and gas economy for life of the plug. Photo shows that Champion's great new Powerfire electrode stands up better than ordinary types. Insist on Champions!

From Kodak—a wonderful

Here are 8 exciting new Kodak Cameras and photo aids that can make your picture-taking easier — more satisfying — than ever! They're made by Kodak — so you know they're good! See them all soon at your photo dealer's.

NEW BROWNIE STAR CAMERAS *take color slides, too!* First Brownie Cameras ever designed to take gorgeous *color slides* (use "Daylight Type" Ektachrome Film in bright sunlight, "Type F" with flash)... as well as lifelike color and black-and-white snapshots. Only setting is for the kind of film you're using (color or black-and-white). Then aim and shoot! Two Brownie models to choose from:



Brownie Starflex Camera—Hooded viewfinder shows your picture big *before* you shoot. Camera only, $9.95. Flasholder, $3.50.

Brownie Starflash Camera—Eye-level finder makes it easy to aim each shot just right. Built-in flasholder for M2 bulbs. Only $8.50.

NEW KODAK ROTARY FLASHOLDER *lets you take 6 flash shots without reloading!* Accepts six M2 bulbs at a single loading, changes bulbs instantly by rotating the turret, ejects all spent bulbs simultaneously—and can be reloaded in split seconds! Equipped for B-C battery power. New, simplified flash calculator. Available in two models to fit most shutter-synchronized cameras. Complete with two carrier discs, each of which accepts 6 flashbulbs per

loading. Only $9.95 or $11.95, depending upon the model required for your camera. (Batteries extra.)

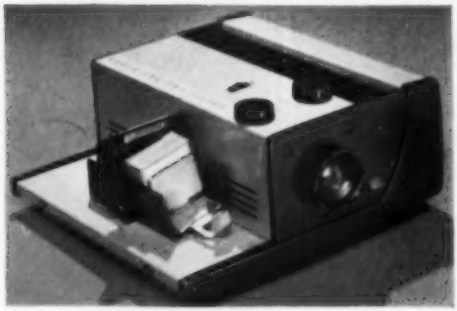
NEW KODAK SIGNET 40 CAMERA—*gets color slides with remarkable ease.* Exclusive dual-reflector flash system and a wide range of 8 shutter speeds take *full* advantage of today's fast films, new midget

Prices are list, include Federal Tax where applicable, and are subject to change without notice

new world of picture-taking!

flashbulbs. Ask your Kodak dealer to show you how easy it is to sight, focus, shoot, and advance the film in a Signet 40—with *all controls* at your finger tips! Superb Ektanon *f*/3.5 Lens . . . 1/5 to 1/400 Synchro Shutter . . . combined rangefinder-viewfinder. Kodak Signet 40 Camera complete with flasholder, dual reflectors, only $69 . . . or as little as $7 down.

NEW KODAK 300 PROJECTOR *is ultra portable—yet shows your color slides bigger!* You can carry this handsome, compact new projector like a portable radio —show any popular-size color slide in it. Sharp 4-inch, *f*/3.5 lens, *plus* a superb new lamp-condenser system, gives your slides brilliant big-screen projection even in a



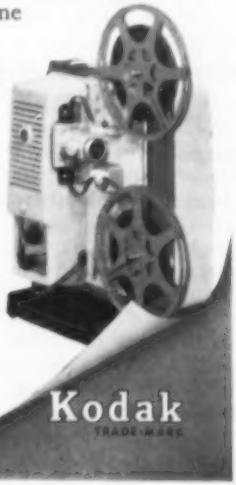
small room. Handy finger-tip controls . . . fast, smooth slide changing. Complete in carrying case. Projector with Readymatic Changer, $59.50 . . . $5.95 down. With magazine changer, $69.50 . . . $6.95 down.

NEW KODAK MEDALLION 8 MOVIE CAMERA, *f*/1.9 *is the easiest-to-use movie camera Kodak ever built!* Small enough to slip in a jacket pocket. Takes only 3 seconds to load with a magazine of film—lets you switch from indoor to outdoor color film any time. You just set the exposure dial to match the light condition . . . aim and shoot. Pre-focused lens accepts low-cost converters for wide-angle or telephoto views. Choice of speeds includes slow-motion and single frame. With *f*/1.9 lens, only $99.50 . . . or as little as $10 down.

Kodak Medallion 8 Movie Camera, Turret *f*/1.9, is as easy to use as the standard model. Completely equipped for regular, wide-angle, and telephoto movies, only $149.50 . . . or as little as $14.95 down.

NEW CINE-KODAK SHOWTIME 8 PROJECTOR *shows 8mm movies 5-feet wide!* New de luxe model features a handy variable-speed control. Projects extra-brilliant half-hour shows with one simplified loading; "stills," reverse action, too! Illuminated control panel. Lubricated for life. Complete in built-in case, $129.50, or $12 down.

Standard model (without variable-speed control) lists at $115, or $11 down.

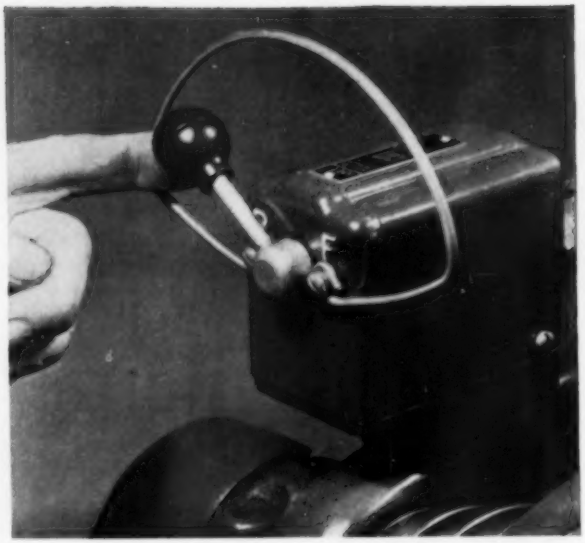


Ask your dealer about small down payment, easy terms

EASTMAN KODAK COMPANY, Rochester 4, N. Y.

Kodak
TRADE-MARK

Short Cuts and Tips



Bent Wire Guards Power-Tool Switch

AFTER accidentally bumping the switch handle on my lathe to the "on" position a few times, I added a guard. It is just a piece of stiff galvanized wire with the ends looped around two bolts on the switch housing. It is big enough to leave plenty of finger room for operating the handle.—*Walter E. Burton, Akron, Ohio.*

Snap Pin Holds Garden Gloves

THE place for a pair of gardener's gloves is in the tool shed or wherever the tools are kept. A common snap clothespin nailed to the wall through one leg will keep them handy and allow them to dry fast when they get wet.—*Victor H. Lamoy, Upper Jay, N.Y.*

Flat Tube Turns Screw Eye

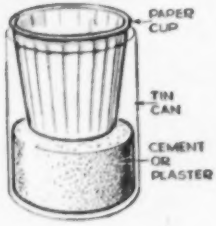
A FLATTENED piece of copper tubing pushed over the blade of a screwdriver is a handy tool for turning screw eyes and cup hooks. Flatten the end of the tubing just enough to fit over the screw eye; then slip the other end over the screwdriver tip and hammer it down to a tight fit.—*Albert B. Walter, Sandusky, Ohio.*

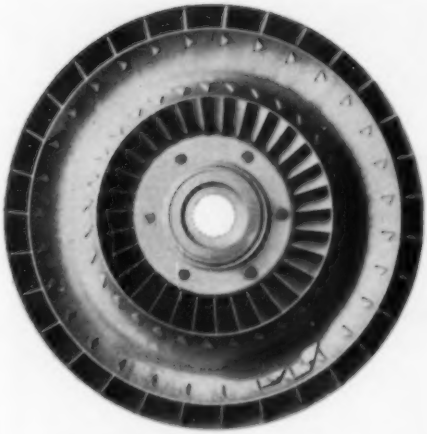
Calking Tube Helps Pouring

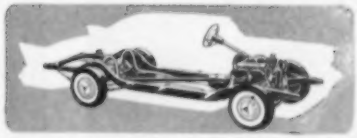
A DISCARDED calking tube makes a handy funnel for pouring liquid into small-mouthed containers. To remove the metal discharging disk, insert a piece of stiff wire through the nozzle end of the tube and push it out through the other end. A good washing with gasoline or turpentine will clean out the old calking compound.—*W. B. Eagan, Floyds Knobs, Ind.*

Tin Can Supports Glue Cup

A TIN can forms a practical support for paper cups used to mix glue. Weight it with enough plaster or cement to lift the cup rim just above the can rim.—*A. V. Malone, Glendora, Calif.*

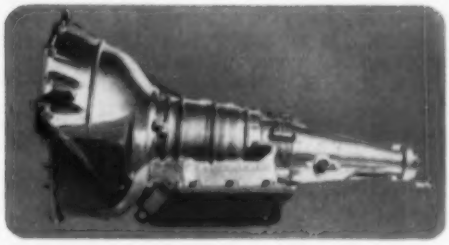






X-RAY ON CHEVROLET

TURBOGLIDE: forecast of the future



You don't have to look on the drawing boards—the answer is plain in any Turboglide-equipped 1957 Chevrolet. Here is tomorrow's drive, with an absolutely shift-free sweep of power, smooth as a plume of steam. Here is a quadrant that doesn't say "LO"—because there is *no* auxiliary planetary gear system needed. Here are *three* turbines for full-torque take-off, brilliant passing power and ultra-thrifty cruising. Here is the finger-flick Hill Retarder for safer slowing on grades . . . all this in a transmission that weighs 30 percent less than any other automatic drive (thanks to the largest production aluminum die casting in the world), with fewer parts, far fewer external openings and absolutely no delicate automatic shift valves. It's an engineering triumph—because it moves without a hint of mechanism. Try it and see! . . . *Chevrolet Division of General Motors, Detroit 2, Michigan.*

CHEVROLET

Short Cuts and Tips

Stepped Stop Sets Depth of Drill

You can drill holes accurately to any depth with a stepped stop. Make it from 3/4" hardwood so it will stand a lot of use.

With a backsaw or bandsaw, cut a series of 1/8" or 1/4" steps 3/4" square. Then drill a 1/4" hole through the center of each, being sure to get them perpendicular. Don't try to calibrate the steps, as drills of different sizes vary in length.

To use the gauge, chuck the drill and try it in the various holes. Measure the amount it extends through the gauge until you find a step that will give the required drilling depth. You can get more precise adjustment by loosening the chuck and moving the drill out a little farther.—*R. & J. Capotosto, Flushing, N. Y.*

Coat Hangers Make Doll Rocker

Doll furniture can be fitted with rockers made from wooden coat hangers. Dowels secure them firmly, but they can also be glued and nailed to the legs.—*George Lemmons, Akron, Ohio.*

▶▶▶When you sand hardwood with fine sandpaper, collect some of the clean dust. Keep labeled jars of different kinds of wood and you can mix up a small amount of dust with a nonstaining glue when you need a matching wood filler for a job.—*Hugh F. Williamson, Butte, Mont.*

Magnifier Prevents Errors

You can be sure of an accurate reading when using a meter-type instrument if you place a small magnifying lens over its face. Lens focal length should be short—less than 2". If there's not enough space between the cover glass and the dial to give appreciable magnification, wrap the rim of the lens with tape to raise it.—*B. E. Wilson, Chicago.*

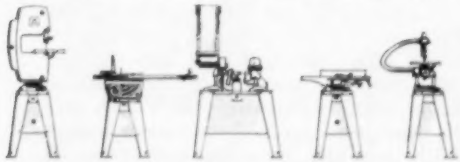
THE NEW MAGNA Saw-Jointer combination gives you the finest 9-in. Saw and 4-in. Jointer ever made! It's the *only* tilt arbor saw with a built-in extension ("The Helping Hand") at no extra cost, giving you the largest (32" x 24") effective table on the market! Single-knob control — push for blade height, pull for tilt • Speed-gear control gives you 45° tilt with only 10 turns of knob (40 to 60 turns on other saws!) • Many other completely new, *creatively engineered* features! The big, heavy-duty MAGNA 4-in. Jointer operates at *any height* of saw blade! It has the longest (28") table, largest (21¾" x 3") fence in its class • 3 high-speed, safety-tapered knives are micro-adjustable • One-piece fence casting is far more rigid, larger!

You can even buy the Saw now and add the Jointer later, with the MAGNA Saw-Jointer Adaptor Kit!

$199.20
(less motor)
Panels, Pistol-Grip, Casters optional.

YOU CAN OWN IT FOR ONLY $2.07 A WEEK!

SHOP SMITH
MAGNA POWER TOOL CORPORATION
America's Finest Power Tools



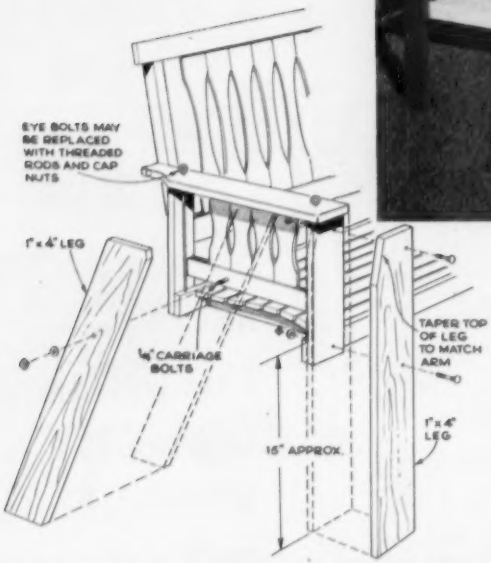
See these other all-new MAGNA-LINE tools: (l to r) 11" Band Saw, 9" Saw, 6" Belt Sander, Compressor-Sprayer, 4" Jointer, 18" Jigsaw.

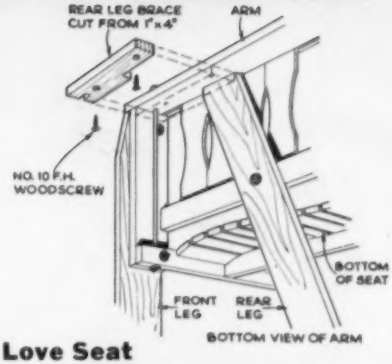
MAGNA POWER TOOL CORPORATION
Dept. 807-S, at factory nearest you:
Menlo Park, Calif., OR Box 2808, Ft. Wayne, Ind.

Please send me a free 16-page catalog describing the Magna Saw-Jointer and the complete Magna-Line.

NAME _____
ADDRESS _____
CITY _____
ZONE _____ STATE _____

Short Cuts and Tips



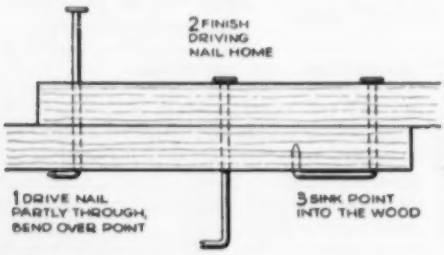


Old Porch Swing Converts to Outdoor Love Seat

A PORCH swing, stored away and idle, can be converted into a love seat for the lawn. Tightening the bolts and screws will usually make it as sturdy as ever. To complete the job, add four legs, two braces and a couple of coats of paint.

Begin by propping the swing on boxes to the desired height above a level floor. About 15″ is a good height at the front. Let it slope toward the rear so that the back of the seat will be 1″ lower. Cut a cardboard template for the rear legs. Clamp two pieces of stock together and saw both from this pattern at the same time. Then clamp the two legs in place.

Before cutting the front legs to final length, clamp them to the arm fronts and try out the bench. Adjust height until the seat is comfortable; then secure all four legs with 1/4″ bolts. Fit the two leg braces under the arms and screw them on.—*D. M. Swartwout, Evanston, Ill.*



How to Clinch a Nail

A CLINCHED nail will hold better and won't snag if the point is buried in the wood. Drive the nail part way through, until about 1/2″ shows, and then hammer the protruding part over flat. Finish driving, and bend again to embed the point.

For best grip, bend the nail *across* the grain; for a smooth surface, *with* the grain. —*Andrew Vena, Philadelphia.*

SOMETIMES your car has to *navigate* . . . on flooded roads . . . crossing deep puddles after heavy rain . . . fording a small stream.

Resist that impulse . . . don't rush! Water resents being "pushed" around. The sudden shock of hitting it *fast* may stall your engine. Splashed water, sucked in by the fan, can give your engine a shower bath and short circuit the plugs and maybe the distributor. Result – you may have a *dead engine*.

Instead, do wade *slowly* in low gear. If your engine *does* get splashed, you can hope the heat will dry it. If not, and your engine sputters, dry the spark plugs and the distributor with a cloth.

Another warning: when water covers the exhaust pipe, engines stop. It can mean a tow job to get you out.

PROTECT your car's lifeline

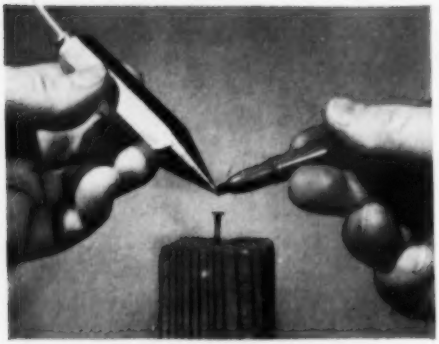
Automatic transmissions need careful servicing. Texaco Dealers are specially trained to service them . . . use only Texaco *Texamatic* automatic transmission fluid, the one which has been most widely used for original filling. See your Texaco Dealer – *the best friend your car has ever had.*

THE TEXAS COMPANY

TEXACO DEALERS IN ALL 48 STATES

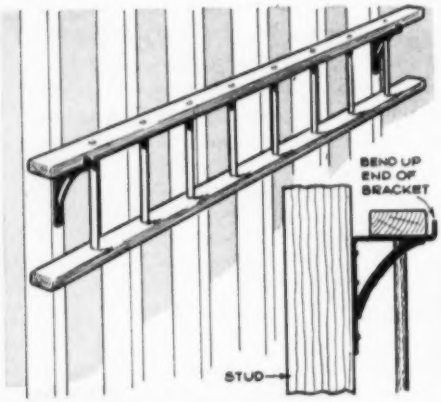
Texaco Products are also distributed in Canada, Latin America, and Africa

Short Cuts and Tips



Crayon Dulls Plumb-Bob Shine

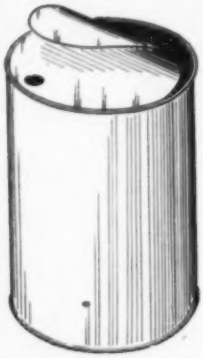
IF THE point of a plated plumb bob is too shiny, you may have trouble positioning it accurately over the center of a stake nail when staking out a building. Make the point easier to see by blackening it with a marking crayon; or cover it by sticking on a small piece of black masking tape.—*Murray Kent, Detroit, Mich.*



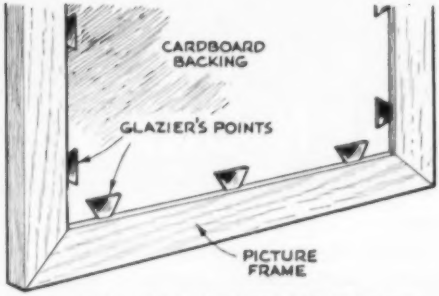
Brackets Rack Up a Ladder

A PAIR of shelf brackets fastened to the inside studding of a garage or other outbuilding provides an excellent rack for storing a ladder. A bend at the outer end of the supporting arm of each bracket will keep the ladder from sliding off.—*Victor H. Lamoy, Upper Jay, N. Y.*

How to Make a Built-In Funnel



A HANDY container that's easy to carry, and to pour from, can be made from any tin can. Open the top three-fourths around and roll back this flap to form a handle. Then punch a pouring hole near the rim in the uncut portion of the top and you will have a built-in funnel.—*Harold W. Frerichs, Olympia, Wash.*



Glazier's Points Hold Pictures

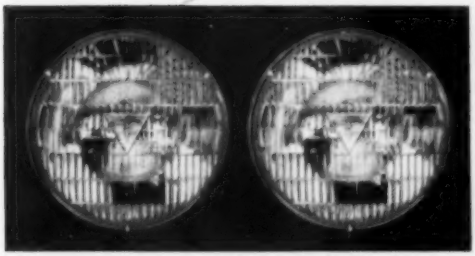
I HAVE found that the little triangular points used for setting window glass are just as handy for fastening the backing in place when you are framing pictures. They go into the frame easily and lie flat without gouging tracks in the cardboard. —*R. M. Woodbury, Natick, Mass.*

Pipe Nipple Joins Tubing

COUPLINGS for standard-size hose are common, but a hardware store may not have one for smaller diameters on hand. You can improvise a coupling by slipping ends of the hose lengths over a short pipe nipple and securing them with small hose clamps.—*James A. Frank, Newark, N. J.*

Here's the BIG DIFFERENCE

in HEADLAMPS today!



NOT THE POWER!

All headlamps built today "see" farther down the road, because the power has been increased by a full 10% on the high beam. Objects that formerly blended with the background should now stand out in bold relief. STILL, POWER IS NOT THE BIG DIFFERENCE!

NOT THE LIGHT PATTERN!

More "seeing distance" along the right side of the road is another big industry advance. On the lower beam, you see farther (eighty feet farther) than was ever possible before. This means, of course, more light on the right. YET, PATTERN IS NOT THE BIG DIFFERENCE EITHER!

BUT, THE AIM!

Power and pattern are unimportant unless headlamps are properly aimed. Only Guide gem-grinds three reference points, or "Guide Points", into each lens, providing positive aiming accurate within a few thousandths of an inch. TODAY, PERFECT AIM IS THE BIG DIFFERENCE IN HEADLAMPS!

Standard equipment on all General Motors cars and trucks.

GUIDE T-3

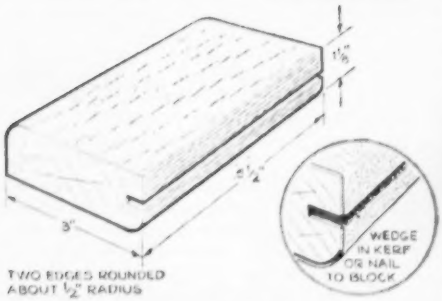
Safety-Aim

HEADLAMPS

Buy In Pairs Where You See AC

AC SPARK PLUG THE ELECTRONICS DIVISION OF GENERAL MOTORS

Short Cuts and Tips



Shaped Sander Fits Work

A SANDING block with two opposite sides rounded off lets you sand concave surfaces with ease. By changing the position of the block, you get two surfaces for sanding even areas, two right-angle edges for getting into corners, and two rounded edges that reach into hollows when the block is tilted. Half a sheet of sandpaper can be nailed to a 3"-by-5½"-by-1⅛" block, or wedged into a kerf cut in one side of the block.—*L. Michaels, Gary, Ind.*

▶▶▶ I BLEND two threading lubricants for use on taps and dies. I put a little white lead in a jar or can and thin it with sulfur-base black cutting oil. When stirred vigorously to the consistency of heavy paint, the compound works well when doing either hand or machine threading.—*R. V. Thomaston, Ames, Iowa.*

Peep Sight Helps Archers

EVEN a novice can hit the bull's-eye with this peep sight attached to his bowstring. Cut the sight from thin metal and solder it near the top of a 14" length of piano wire. At right angles to it, and 6" below, solder a nock piece made of shim brass filled with solder. Place the nock piece, over which the arrow notch fits, at the center of the bowstring, and fasten the assembly in place with thread that is wrapped the entire length of the wire.—*Austin H. Phelps, Omaha, Nebr.*

Takes a Nail to Remove a Nail

WHEN repairing old chairs, you sometimes find joints that have been pinned with a brad or other thin nail. It's a problem to free the pin without damaging the wood. File or grind the point of another nail flat and punch the imbedded one through. When the pin emerges on the other side pull it out with nippers.

MODEL 149B. *¼-inch drill; AC-DC 25 to 60 cycle; 115 volts; 2500 rpm. free speed; 1500 rpm. load speed; 3 lbs.; U.L. approved.*

Here's the answer to the tough ones—the jobs that defy ordinary drills! Yes, now you can have power tools by Remington, the newest name in power tools...the greatest name in sporting firearms and ammunition for 141 years.

Model 149B has the power of drills costing twice as much! And it's built for superior performance on the most rugged jobs—as are *all* of Remington's famous Mall power tools.

With its attachments, this drill can be used as a saw, planer, sander, polisher, paint mixer, hedge trimmer, screw driver, and in many other ways. Saves hours of work.

There's a power tool by Mall Tool Company, Division of Remington Arms Company, Inc., for every need. For further information just fill out the convenient coupon.

Remington Mall

MALL TOOL COMPANY
Division of Remington Arms Company, Inc.
25000 South Western Avenue • Park Forest, Illinois

Electric Saws for every carpentry job.

Belt and Orbital type sanders.

**Prices and specifications subject to change without notice.*

MALL TOOL COMPANY, Division of Remington Arms Company, Inc. Dept. D7
25000 S. Western Avenue, Park Forest, Illinois
Please send free catalog on Portable Electric Tools.

NAME _____

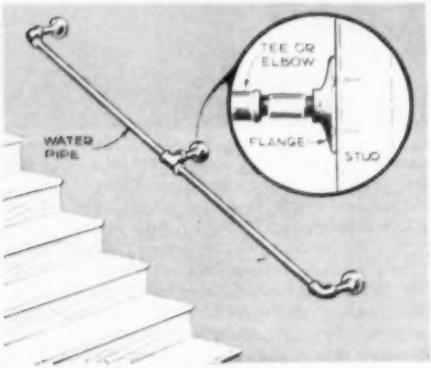
STREET _____

CITY _____ ZONE ____ STATE _____

Short Cuts and Tips

Rolled Screen Makes Brush

A STRIP of wire screening makes a good brush for clearing rust from tools, flaking paint from metal, and similar scraping jobs. Fray out some horizontal strands on the long side of the strip and roll it up. Bind the roll with wire and wedge it into a sturdy jar or a deep jar cap. As the wire bristles wear down, take the screening out and lengthen them again.—*Frank A. Jackson, Newark, N. J.*



Pipe Makes Simple Stair Rail

A CHEAP but sturdy stair rail for basement or attic stairs can be made from two lengths of water pipe joined with a tee. A 3" or 4" nipple is turned into the tee and into elbows at each end of the rail. Cap the nipples with pipe flanges and screw the rail at each end to the wall studs. —*Victor Lambert, Rochester, N. Y.*

Photo Meter Checks Headlights

EVEN after properly marking a garage door and aiming each sealed-beam headlight separately, I wasn't sure that the bright spot was perfectly "on target." That is, I wasn't until I tried using my exposure meter. Holding it against the door and pointing it towards the uncovered headlight, I found that it indicated the exact position of the bright spot.—*Marshall Woodson, Corning, Calif.*

▶▶▶IF YOUR tin shears refuse to cut even though you sharpen the edges, try this: Separate the halves and grind down the inside faces just around the pivot holes. This should bring the two cutting edges closer together so that they will bite properly into the metal that you want to cut.—*R. F. Schleicher, Bloomsburg, Pa.*

Wax Protects Tools in Use

A COATING of grease or an airtight wrap is fine for stored tools, but what about those you use all the time? I protect these with a coating of hard paste wax, rubbing it on as though I were polishing the tools. This not only seals out moisture, but sheds shop dust as well.—*A. J. Franklin, North Bergen, N. J.*

Special Introductory Offer— All Four for $2.25!

Here's just what you need to spruce up your car for spring! It's all in one handy carrying kit, and at a special new low price. Included in this MoPar Car Care Kit are: (1) Fast-acting **MoPar Automobile Polish.** Apply . . . let dry . . . wipe clean, (2) **MoPar Liquid Chrome Polish.** Quickly removes tarnish . . . restores original brilliance, (3) **MoPar Glass Cleaner.** Spray on . . . wipe off . . . leaves no streaks or blurs, (4) **MoPar Lint-free Polishing Cloth.**

Buy a kit, and other easy-to-use MoPar Car Care materials, from your local Plymouth, Dodge, De Soto, Chrysler, or Imperial dealer, or better repair shops today! MoPar means highest quality!

MOPAR
PARTS & ACCESSORIES

CHRYSLER CORPORATION PARTS DIVISION
DETROIT 31, MICHIGAN

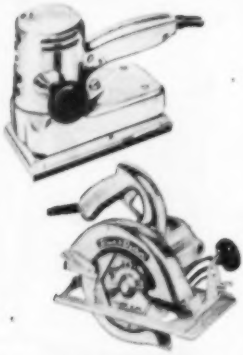
Touch up scratches in seconds with new MoPar Paint Applicator — $1

Comes complete with self-storing brush and built-in paint supply. Stops rust before it starts. Dries evenly and quickly to a sparkling finish.

$10,000

NOTHING TO BUY! ENTER AT YOUR

DELTA



BLACK & DECKER

1ST PRIZE

Your Dream Workshop!

Almost $1300 in top quality merchandise! Winner gets (1) a Delta 11" lathe, 10" bandsaw and a complete "Deltashop"; (2) Black & Decker Orbital Sander, Jig Saw, Heavy-Duty Saw and ¼" Drill; (3) your choice of $100 worth of Stanley hand tools—saws, hammers, planes, etc; (4) your choice of $350 worth of Weldwood plywoods, paneling, glues and finishing materials.

SECOND PRIZE—worth over $700! Winner gets (1) a complete Delta "900" Radial Saw Workshop; (2) Black & Decker Orbital Sander, Jig Saw, and Utility Drill; (3) your choice of $50 worth of any Stanley hand tools; (4) your choice of $250 worth of Weldwood products.

5 THIRD PRIZES—each worth more than $330! Winners get (1) complete Delta 9" Tilting Arbor Circular Saw; (2) Black & Decker Heavy-Duty Saw; (3) your choice of $50 worth of Weldwood products.

60 FOURTH PRIZES—each worth more than $70! Winners get (1) Black & Decker Utility ¼" Drill; (2) your choice of $30 worth of Stanley hand tools; (3) your choice of $25 worth of Weldwood products.

80 FIFTH PRIZES—each winner to get his choice of $25 worth of Weldwood products.

(All prizes approximate retail value.)

ACT NOW! CONTEST CLOSES MAY 31ST!

Weldwood® Old Craftsman

in Prizes!

LUMBER DEALER'S! 147 CHANCES TO WIN!

HERE'S ALL YOU HAVE TO DO:

Weldwood is offering $10,000 in prizes—quality power tools, hand tools and Weldwood products—to introduce Weldwood Old Craftsman Pine Plywood. We want you to get to know this easiest working, easiest painting plywood ever! And all you have to do is go to your lumber dealer's—take a look at Old Craftsman Pine Plywood—pick up an Official Entry Blank—and, in 25 words or less, tell us *"I like Weldwood Old Craftsman Pine Plywood because——."*

If you buy Old Craftsman Pine Plywood, you'll discover plenty to like about it—for it combines all the advantages of pine lumber, with all of the advantages of rugged plywood construction. So don't delay! Get to your lumber dealer's now and see and try Weldwood Old Craftsman Pine Plywood. (If your dealer does not have entry blanks available, write to Old Craftsman, c/o United States Plywood Corp., 55 West 44th Street, N. Y. 36, N. Y.)

To tell you even more about Old Craftsman—and to make your next project easy to build—leading lumber dealers are offering this special book: "Projects You Can Build With Old Craftsman Pine Plywood." 96 pages. Full of hints and ideas; 18 projects with complete instructions. Build furniture, cabinets, built-ins, toys—easily!

LOOK FOR THIS LABEL ON EVERY PANEL

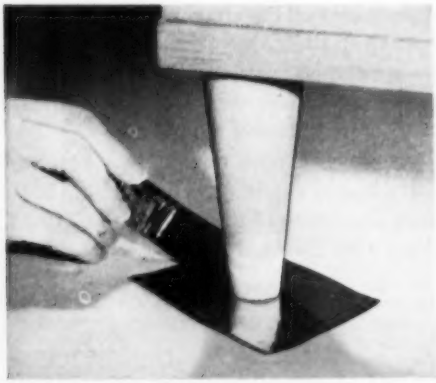
GET FULL RULES AT YOUR LUMBER DEALER'S!

Pine Plywood Contest

Short Cuts and Tips

Pipe Fence Frame Carries Water

After installing a wire fence on a framework of galvanized pipe, I hit on the idea of running water through the piping that forms the top rail. Now I have a faucet at each corner post. I can water my lawn without lugging a long and heavy hose, and stop off for a drink if I'm thirsty.—*J. R. Rogers, Tulsa, Okla.*



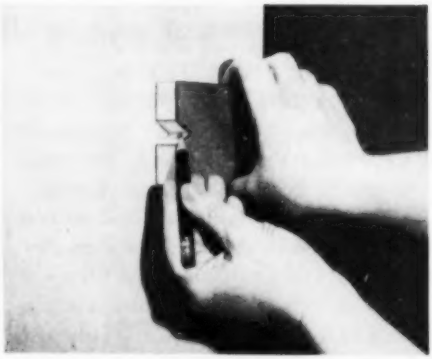
Foil Paint Catcher Saves Work

Freshly painted chairs and other pieces of furniture usually stick to newspapers laid to protect the floor. A square of aluminum foil slipped under each leg of the furniture will break away cleanly.

Oilstone Joints Saw Blades

If you sharpen your own power-saw blades, you can joint a blade in the saw before removing it for filing. Run the blade down almost flush with the table top, then touch the tips of the teeth lightly with an old oilstone while the saw is running. This will even the teeth prior to filing and setting. Wrap paper around the oilstone to protect the table top.—*C. C. Colson, Buffalo, N.Y.*

▶▶▶ Plastic tape will keep small, flat objects from sliding beneath desk drawer dividers. Fold the tape lengthwise and apply it to drawer and divider to seal the crack.—*R. L. Clough, Bristol, N.H.*



V-Cut Block Is Contour Scriber

When fitting panels into a corner, or linoleum against a wall, you may find that the wall is actually curved or crooked. Yet you must follow its curve to make a neat joint. A block of wood with a notch in one end will help you do it. Press the block into a corner, holding a pencil in the notch. With the panel in place, slide the block along the wall. This will give you the right cutting line.—*F. A. Javez, Newark, N.J.*

THE WONDER PAINT REMOVER

Strypeeze strips all finishes-fast, safe, easy

Easy. Just. brush on and watch Strypeeze go to work on shabby furniture, floors, woodwork!

Fast. Str - r - i - p - p - p! Cuts deep through *every* layer – even on vertical or curved surfaces.

Whatever you refinish, let Strypeeze do the hard work for you. Harmless to hands or wood. Available at paint and hardware stores everywhere.

Kwikeeze cleans all brushes fast! Even the hardest brush softens in a jiffy with KWIKEEZE. No rinsing, no mess. Perfect for all bristles.

SAVOGRAN, The Remover Corporation of America

SAVOGRAN
Dept. 403, 25 Huntington Ave., Boston, Mass.

Please send me new illustrated booklet, "How to Remove and Restore All Finishes". Enclosed find 25¢.

Name _____

Address _____

City _____ *Zone* _____

State _____

[*Continued from page 174*]

contains combinations of additives that work to minimize sludge and corrosion.

3. Or you can buy a do-it-yourself additive. One of the newest is Du Pont's "No. 7 M.O.A." (motor-oil additive). It has just been introduced nationally this spring.

M.O.A.'s chemical name is lauryl methacrylate/diethylaminoethyl methacrylate. Its giant molecules, like those of other detergent molecules, wrap around particles of sludge too tiny to be visible and encase them in envelopes, thus preventing them from adhering to other particles of sludge. The tiny particles accordingly remain suspended in the oil, easily pass through screen and filter and are drained off when the oil is changed.

Du Pont does not claim that its No. "7" M.O.A. dissolves sludge already formed, but it maintains that the new motor-oil additive prevents additional sludge from collecting, at both low and high driving temperatures.

Du Pont researchers also announced that No. "7" M.O.A. maintains more uniform oil viscosity under all driving conditions, so that the oil is thin enough for low-temperature operations and still does not get too thin at high temperatures.

Before No. "7" M.O.A. was put on the market, it was tested, in comparison with 10 other additives, in a fleet of taxicabs. Each cab was driven 50,000 miles under conditions most conducive to the formation of sludge. Then the engines were taken apart. Those that had used the new chemical were nearly as clean as when they started the test, and showed little wear. Many of the others were choking with sludge; some revealed heavy wear on camshaft exhaust and intake lobes and on the rocker-arm shafts.

No. "7" M.O.A. was the only one of the additives tested that worked well in water-contaminated crankcases. And the presence of water is the chief reason why low-temperature driving with ordinary motor oil produces so much sludge.

Even with an additive, whether tailored into the oil by the refiner or added later, piston-ring wear is very high when cylinder-wall temperature is low. For instance, when the temperature of cylinder walls is only 100 degrees, piston-ring wear has been found to be more than 25 times as great as when the walls are 160 degrees. In cold starts, moreover, there are periods when the walls are far below 100. The only practicable solution is to minimize cold starts, and to make sure the engine is allowed to warm up. For this a properly working thermostat, preferably a high-temperature one (180 degrees) is advisable.

To combat the problem of low spark-plug nose temperatures in stop-and-go driving, be sure to clean your car's plugs every 5,000 miles, or whenever one misfires. Better still, change to hotter-range plugs. These bring the temperature up quickly when you are making slow, short trips.

Ordinary cars? Not on your life! Cop cars are souped up plenty. Read "Why You Can't Outrun the Police" in May PS.

Use a corrosion inhibitor to prevent the accumulation of rusted scale in the car's cooling system. Scale interferes with the proper functioning of the thermostat and, paradoxically, can cause your engine to run cold.

On cold mornings, don't start your car and let it run for a long while without moving. The car's heater warms *you* —but the engine, with almost no work to do, is not getting comparably warm. And it is forming sludge at an accelerated rate.

There is a simple but effective way to deal with the problem of corrosive liquids in your car's exhaust pipe and muffler. Next time you have the car serviced, ask the serviceman to free the drain hole in the bottom of the exhaust muffler. It gets clogged with rusted scale, thus allowing corrosive liquids to pool inside. The point of an ice pick will free the drain hole in a jiffy. END

Wizard Tune-Up Kit makes it easy to "tune" ignition system. Complete kit with heavy duty points, condenser, rotor. Saves gas, makes car start easier, run smoother, perform better. Easy instructions. All popular cars. (L6015-32)... From **$1.15**

Wizard "Twin-Fire"* Spark Plugs . . . guaranteed 18,000 miles! Give top performance twice as long as single electrode plugs. (Alternate firing twin electrodes stay accurately gapped up to twice as long.) Sets of 4 or more, ea. (L1070-95) **79c**

Guaranteed leakproof, blowout-proof. Wizard Muffler protects against carbon monoxide gas fumes . . . gives "new car" silence. Original equipment specifications. Heavy, long-lasting steel. All popular cars. (T1148-1506) From **$5.95**

Tune Up... Tone Up Your Car For Spring

Choose from over 4,000 guaranteed top quality parts and accessories at

Western Auto

Stores and Associate Stores

New Wizard Fuel Pumps, guaranteed original equipment quality. Precision machined parts; fully tested. Top quality diaphragm for long life. All popular cars. Single action pumps. (R7200-90) From **$2.79**
Dble. action (R7305-35)... From **$8.05**

Entirely new kind of wax! Vista, made by Simoniz, is a new turbo-whipped *cream* wax that cleans and waxes in one easy application . . . yet gives cars the lustre and all-weather durability of a paste-wax job! 10 oz. can (SP7727) **$2.00**

Protect floor of your car and help keep trade-in value high with these twin Floor Mats. Cover entire front area, flat and slope. Designed to stay in place. Fit all cars. All new rubber. Black, red, blue, green, yellow, white. (2511-30-5) Pair **$4.69**

NOTE: In some areas of the U.S., Hawaii, Alaska, Mexico, and Puerto Rico, prices slightly higher. Western Auto Associate Dealers own their stores, set their own prices, terms and conditions. (PS47)

Superchargers Spur Horsepower Race

[Continued from page 109]

No exact figures on the blown Ford or Thunderbird are available at this writing, but they should both be fully as rapid.

Some comparisons between the blown and the standard 312-cu.-in. Ford V-8 (with four-barrel carburetor) have, however, come from Dearborn. The supercharged 300-hp. job accelerated from 0 to 60 m.p.h. 26 percent faster than the standard 245-hp. model. It covered 25 percent more distance in the first 10 seconds after a standing start. A 1956 T-Bird with standard McCulloch blower and owned by movie star Clark Gable has done 0 to 60 m.p.h. in a smoking six seconds flat.

Every hop-up trick exacts a price and supercharging is no exception. A blown Hawk, for example, *can* deliver 16 m.p.g.—on level ground with a steady foot on the gas pedal. The variable-rate pulley makes this possible. At modest speed the low-boost rate takes over automatically and virtually no extra fuel is used. But the instant you bear down on the pedal a pulley change throws the blower into high-boost operation. The extra performance it gives needs extra gas, naturally.

Engine stresses and wear are inevitably greater, though factory engineers claim that the margins of reserve are ample. Spark plugs would be expected to burn up faster in the hotter confines of a supercharged cylinder, but both Studebaker and Ford claim plug life equals that on any V-8 engine. Ford has not changed plugs, by the way, though Studebaker uses a cooler firing one in the Hawk.

Fan belts, with a heavy load to spin, might be expected to wear out before their time. Not so, says Michael P. deBlumenthal, S-P's chief engineer. On the South Bend proving ground a Hawk logged over 38,000 miles without showing a sign of belt wear.

Blower noise is no factor at all in the new Clipper. But the Golden Hawk lets it be known, deliberately, that there is plenty of authority under the sheet metal. A motorist who buys a semi-sports car wants to hear a little jet-like reaction, so the theory goes.

That's just what I got in moderate quantities while driving a Hawk. Up to about 60 m.p.h. blower noise was scarcely audible above normal road and wind noise. As the car accelerated beyond 60, however, the supercharger began to whine, its pitch increasing with speed. Even so, the blower noise is not irritating. The engine simply announces that up to 60 it's just been loafing along, but now it's ready to show it can hustle when asked.

I found only one flaw, a minor one, in the Golden Hawk: On cold mornings, engine warmup takes an agonizingly long time.

The Ford decision to offer supercharging was undoubtedly influenced by concern over Chevrolet's fuel injection. Off to its best sales start against its archrival in over two decades, Ford was unwilling to pass up any advantage, however slim.

For Studebaker-Packard, supercharging was practically mandatory to avoid the high crime of reducing horsepower from one model year to the next. Last year's Golden Hawk obtained 275 hp. from its big (352-cu.-in.) Packard engine. But this engine has gone out of production and Studebaker must use its own smaller (289-cu.-in.) V-8, rated at 210 hp. with a carburetor. Obviously the 65-hp. deficiency had to be made up, and the supercharger bridged the wide gap.

Price-wise, S-P is better off than Ford. The unit is standard on Golden Hawk and Clipper, yet there has been no material increase in price over last year. Studebaker was able to hold costs in check mainly because it no longer must buy the comparatively expensive Packard engine from an "outside" supplier. Golden Hawk prices advanced only half the industry's average boost of 7½ percent. END

ALADDIN READI-CUT HOUSES ARE ENGINEERED TO SAVE YOU THOUSANDS OF DOLLARS!

BUILD IT YOURSELF!—Aladdin designed and manufactured the first Readi-Cut Home over 50 years ago. Tens of thousands of people have discovered how easy it is to build an Aladdin. Our customers have saved thousands of dollars by doing part or all of the work themselves. **NOT PREFABRICATED**—The lumber is cut to fit by precision machines, ready to be nailed in place. Each piece is marked and shown on our erection drawings. **QUALITY**—All materials . . . lumber, doors, windows, flooring, paint, hardware . . . everything furnished are highest quality. Not only do you save—your finished Aladdin Home will be a joy to behold—beautifully designed and solidly constructed to meet the highest building standards. **CATALOG**—Send for Aladdin's handsome new catalog now and you will understand how Aladdin can save you up to 30 or 40% on your new home. Mail the Coupon today.

120 Modern READI-CUT PLANS
5 to 8 Rooms from $3,000
WE PAY THE FREIGHT
RANCH • TWO-STORY
COLONIAL • CAPE COD

SEND 25¢ FOR 72 PAGE CATALOG IN COLOR

MAIL COUPON TO:
The ALADDIN CO., Bay City, Mich.

M-41

Name _____

Street _____

City _____ State _____

Your car deserves a

Sealed Power

KROMEX RING SET

Save Oil! Save Gas!
Gain Power!

Write for free manual, "Care and Feeding of Engines." Sealed Power, Dept. H-4, Muskegon, Mich.

Sealed Power

PISTON RINGS

BEST IN NEW CARS! BEST IN OLD CARS!

Don't Believe These Tales About Rattlers

[*Continued from page 117*]

the Atlantic to be applied to rattlesnakes, is that of the child who befriends a snake. In the usual version a child, generally a girl, repeatedly carries her lunch out into the yard to eat. Finally the curiosity of her parents is aroused; they follow her and watch her sit down to enjoy her bowl of bread and milk. At once a huge snake—often a rattlesnake, if told in the United States—issues from the grass and coils beside her, to be fed milk and bread with a spoon. The horrified parents destroy the snake, with the result that the child, pining for her playmate, goes into a decline and dies.

There are many stories, some no doubt true, some legendary, about children found playing innocently with rattlesnakes. Doubtless this has often happened, since young children are usually not afraid of snakes. Although serious and sad accidents have resulted from occurrences of this kind, many have ended without harm if the rattler has not been frightened or roughly handled. From such has grown the dangerous myth that rattlers won't bite children.

Of all these myths, that which has most deeply affected human impressions and attitudes toward rattlesnakes is the one that pictures these snakes as malignant, vindictive and crafty, with an especial hatred of mankind. Recently a radio commentator called rattlesnakes the "symbol of pure evil."

But a rattlesnake is only a primitive creature with rudimentary perceptions and reactions. Dangerous it surely is, and I hold no brief for its survival except in remote areas where its capacity to destroy harmful rodents may be exercised without danger to man or his domestic animals. But that the rattlesnake bears an especial enmity toward man is mythical. It seeks only to defend itself from injury by intruders of superior size, of which man is one. It could not, through the ages, have developed any special enmity for man, since the first human being any rattlesnake may encounter is usually the last. END

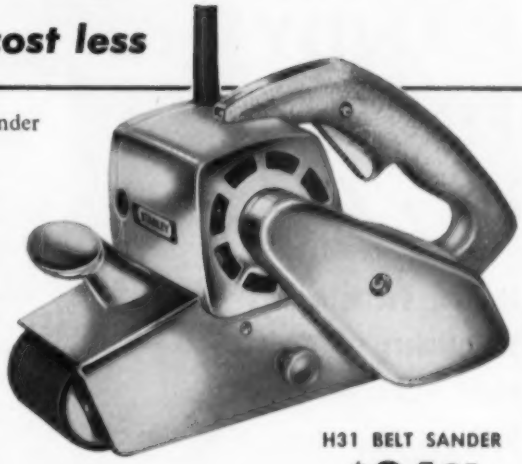
New Stanley Heavy Duty Sanders

they do more . . . cost less

The big new H31 Heavy Duty Belt Sander ***does more —***

- ***Because*** it sands faster than other belt sanders . . . 3" x 24" or 3" x 23¾" belt.
- ***Because*** the ball bearing motor runs cool and stays cool . . . never too hot to handle.
- ***Because*** the drive belt delivers full power to the sanding belt.
- ***Because*** it doesn't need constant lubrication.

It costs less —
less than any comparable heavy duty belt sander sold today.



H31 BELT SANDER
$84.95

The smooth new H36 Heavy Duty Orbital Sander ***does more —***

- ***Because*** it sands faster than other orbital sanders.
- ***Because*** the ball bearing motor runs cool and stays cool.
- ***Because*** the pad is wide and absolutely flat . . . 3⅝" x 9" paper size — ⅓ of standard sheet.
- ***Because*** full power is delivered to the pad.

It costs less —
less than any comparable heavy duty orbital sander sold today.

H36 ORBITAL SANDER
$49.95

Try these fine new sanders. Your Dealer has them or can get them for you. Stanley Electric Tools, Division of The Stanley Works, New Britain, Conn.

AMERICA BUILDS BETTER AND LIVES BETTER WITH STANLEY

STANLEY

This famous trademark distinguishes over 20,000 quality products of The Stanley Works—hand and electric tools • drapery, industrial and builders hardware • door controls • aluminum windows • metal parts • coatings • steel and steel strapping—made in 24 Stanley plants in the United States, Canada, England and Germany

FOR HARDWARE WEEK ONLY
APRIL 25 through MAY 4

NICHOLSON HANDY FILE

only 75¢

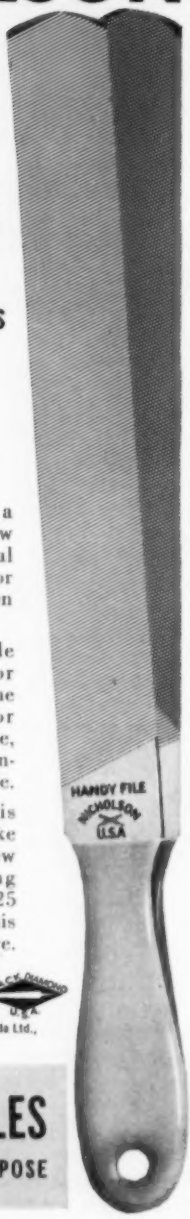
(regularly 96¢)

Amateur Cabinetmakers
Boatbuilders
Model Railroaders
Week-end Carpenters

. . . *every* handy man needs a Handy file. And at this low price, you should get several . . . one for the garage, one for the shop, one for the kitchen drawer tool collection.

One side of the versatile Handy file is single-cut for sharpening and finishing. The other side is double-cut for fast filing. Needs no handle, because it's forged with a convenient grip and hang-up hole.

Take advantage of this double-barreled offer: it's like getting *two* files for the new low price of one . . . during Hardware Week, April 25 through May 4. Don't miss this offer at your hardware store.



NICHOLSON U.S.A. **Nicholson File Co.** Providence, R.I. BLACK DIAMOND U.S.A.
(In Canada: Nicholson File Company of Canada Ltd., Port Hope, Ontario)

NICHOLSON FILES
A FILE FOR EVERY PURPOSE

60 Days and Nights in an Inferno

[*Continued from page 131*]

surging across the whole width of the newly created lake.

Oil fires are hot enough to melt steel derricks like candles. Akuinu's blaze brought down the 120-foot-high, $250,000 steel derrick, tumbled it and all its machinery into the crater. The lake swallowed it, as the sea hauls down a sinking ship.

In hours, Akuinu camp had gone; the derrick had disappeared; a brand-new lake was there—in flames. Clark thought the fire department should be called.

Jan. 18

Problem: There are not many firefighters oil men can call. "Accidents," explains an oil company's journal, "keep their ranks thin." Canadian Gulf, which owned the Akuinu well, phoned the man known as the world's best oil firefighter: Myron Kinley, down in Houston, Tex.

Though the well was 115 miles northwest of Edmonton, in 36 hours five Kinley men, headed by famed Red Adair, were struggling at Akuinu. Kinley's method is to haul away the wreckage, then dynamite the fire in the well. (The blast snuffs out the flames.) But here his men couldn't: Flames, heat and the molten muskeg, which won't support a man, much less a truck, kept them from getting close enough to hook onto the derrick which, after all, was at the bottom of a boiling lake. They had to give up and withdraw.

Jan. 19-25

What you do next, as any oil man tells you and Earl Clark does, is drill another well. Down it you pump water and cement in an effort to seal off the gas. The new well, of course, has to be got down while the fire rages. This one had to be located away (600 feet) from the flames. It had to be angled so its bottom would reach the bottom of the wild well where (everyone believed) the gas was coming from. This would require a small army of men and equip-

[*Continued on page 246*]

Half a turn... and a Southern Screw holds firm!

This simple test proves the superior quality of precision-built Southern wood screws . . . Against a small piece of rough scrap lumber, place the point of a Southern wood screw. Apply firm pressure while making a half-turn of the screw . . . See how Southern takes hold quickly, holds tight!

This simple test DOES NOT mean you should discard your screwdriver, or forget that pilot holes help make for better craftsmanship . . . But the test does prove that quality—plus Southern Screws are gimlet pointed, to give a firm, fast start—Makes driving easier.

Buy Southern Screws and Bolts by the box—or buy 'em in Southern's Home Shop Screw Dept., No. 1 or 2. Each Dept. contains over 1400 bright plated pieces that save you time and trips to the store, and cuts fastener costs up to 50%!

If you need our FREE TC-4 folder, showing how the professionals select and use wood screws and sheet metal screws, drill pilot holes, etc., etc., mail the coupon below—today.

Wood Screws • Machine Screws & Nuts • Tapping Screws • Wood & Type U Drive Screws • Stove Bolts • Dowel Screws • Hanger Bolts • Carriage Bolts

Southern SCREW COMPANY
STATESVILLE • NORTH CAROLINA

Southern Screw Company
Box 1360-PS47
Statesville, North Carolina

Send FREE TC-4, "Selecting and Using Wood Screws and Sheet Metal Screws"

Name _____

Address _____

City _____ **State** _____

Sold Through Leading Wholesale Distributors • Warehouses: New York • Chicago • Dallas • Los Angeles

Wonderful things happen when you put

Gold Bond TWINSULATION in your attic

- Upstairs rooms stay up to 15° cooler in summer
- Your whole house keeps warmer in winter
- You save as much as 25% in fuel bills

...and you can do it yourself in one afternoon!

Did you ever dream that just by insulating your attic with Gold Bond TWINSULATION you could make your *whole house* more comfortable?

TWINSULATION is actually *two* insulations in one. Rock wool to block heat (there's nothing better) and aluminum to reflect heat (invaluable in summer).

You just tuck the blankets of TWINSULATION® between studs or rafters and staple them in place. The Gold Bond® dealer in your town will show you how. He'll lend you a stapler, too. You can increase your home comfort by seeing him soon. And ask him for your free copy of Gold Bond's Do-It-Yourself Book. It tells why, where and how to insulate.

National Gypsum Company, Buffalo 2, N. Y.

Gold Bond
BUILDING PRODUCTS
NATIONAL GYPSUM COMPANY

60 Days and Nights in an Inferno

[Continued from page 244]

ment. And two unbridged rivers—the Pembina and the Athabaska—lay between the well and the needed help.

Solution: The men at Akuinu turned to and pumped water onto ice in the rivers till the ice was four to five feet thick and would support trucks, trailers, and bulldozers. Radio rounded up oil-field workers and equipment from all over western Canada. A new derrick was located, lying on the ground awaiting use, at the Stettler oil field a couple of hundred miles away. It arrived on a giant lowboy trailer. Other arrivals: 153 men plus trailers for them to live in; four prefab steam-heated water tanks (for water to be poured down the new well); two prefab pumping stations (to get water from rivers); 43 trucks to cart water from pumping stations to the tanks, which were to be erected at the well site. You couldn't use a pipeline in weather that cold.

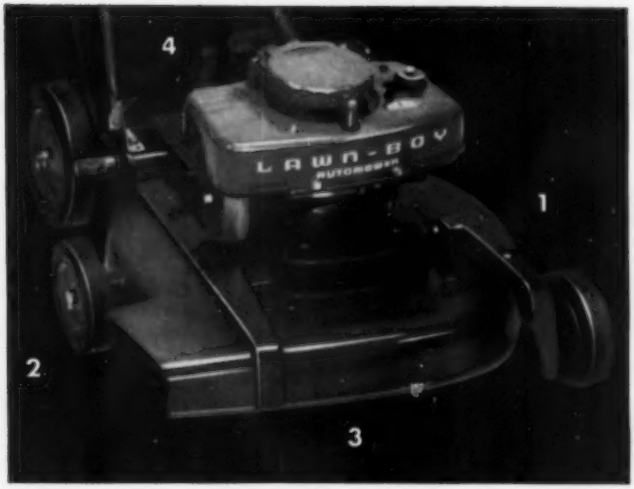
Jan. 26-Feb. 26

Drilling the relief well took a solid month. As the work went on, the wild well went wilder. It had cratered before. It cratered again, formed a new hole—and lake—only 250 feet from the new well. Gas poured upward through the second crater, but at first didn't catch fire.

Now the men feared the gas might force its way to the surface anywhere, anywhere at all. This happened. One man heard the now-familiar hiss of rushing gas right behind his heels. He looked, found a crack in the ground, with some gas pouring through it. It was only 50 feet from the newly erected water tanks.

The gas flow near the tanks simply stopped all by itself. But the gas from the new crater threatened to envelop the whole relief well. To keep it away, it had to be set afire, at its crater, by throwing a burning stick into it. Now there were two blazes over a wide area, which bulldozers worked like mad to wall off with earth. The two fires alternately died and

[Continued on page 248]



❶ Exclusive "Activated" Pilot Wheel keeps LAWN-BOY level . . . even on rough turf grass surface is cut level.

❷ Staggered Front Wheels let LAWN-BOY go right up and over high spots without leaving scalped patches.

❸ Aluminum Die-cast Housing and specially close-machined blade with stabilizer lets LAWN-BOY trim to ⅜".

❹ *Lightweight* Automower . . . it's self-propelled! With the surest, simplest control ever . . . no oily chains, no clanking gears . . . a forward roll of the wrist starts LAWN-BOY out at a steady even pace . . . a backward roll—it stops.

LAWN-BOY "KNOW-WHY" DESIGN GIVES THAT FAMOUS **LEVEL-CUT** TO LAWNS

Every detail of LAWN-BOY is designed to give that LEVEL-CUT. To make absolutely sure each detail is right LAWN-BOY makes almost all their parts and assemblies.

"KNOW-WHY" DESIGN DEMANDED THE LAWN-BOY 2-CYCLE ENGINE

Created and made for LAWN-BOY by LAWN-BOY

Naturally efficient. . . LAWN-BOY operates at 3200 r.p.m. . . . the truly efficient speed for rotary mowing. No adjustments needed! Ideal mowing speed is LAWN-BOY's natural speed.

Power on every stroke gives instant response to additional loads . . . starts quicker with twice as many firing chances.

Rugged, Lightweight . . . fewer moving parts means lighter weight, less friction, less maintenance. LAWN-BOY aluminum die-casting gives great strength and wear to all parts.

No lubrication problems . . . pre-mixing fuel and oil eliminates messy crankcase drain and refill . . . you never have to worry about proper lubrication with LAWN-BOY.

Easier to start . . . because LAWN-BOY 2-cycle has fewer moving parts, there is less friction, lighter weight, more firing chances; easier pull through and more revolutions per pull.

LAWN-BOY IS DESIGNED IN EVERY DETAIL TO LEVEL-CUT LAWNS—EASILY!
Prove it to yourself—try a LAWN-BOY today!

LAWN-BOY

LAWN-BOY, Lamar, Mo. • Division of Outboard Marine Corp., makers of ***Johnson*** and ***Evinrude*** Outboard Motors • In Canada: LAWN-BOY, Peterborough, Ontario

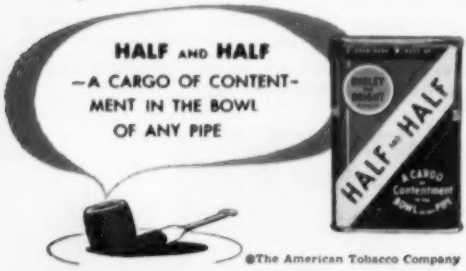
LAWN-BOY dealers are listed in the yellow pages under Lawn Mowers, or call Western Union, by number, and ask for Operator 25.

LOOK IN THE YELLOW PAGES

Relax—and be content

ONLY **HALF** AND **HALF** GIVES YOU SUCH COMPLETE CONTENTMENT

Relax—and be content. Enjoy the pleasure of a bowlful of aromatic **HALF AND HALF.** Each puff of this matchless tobacco brings you *deep-down* satisfaction . . . helps you feel at ease. Even the aroma carries contentment. Contentment for you and everybody near you. Enjoy a wonderful feeling of well-being. Buy **HALF AND HALF** in the pocket tin—today!



©The American Tobacco Company

60 Days and Nights in an Inferno

[*Continued from page 246*]

flared up again, till finally only the fire in the original crater remained, burning in all its fury.

Feb. 27

The new well was angled so successfully that its bottom hit within 12 feet of the old well's. Now tons of water had to go down it to smother the gas, and the fire, far beneath the surface of the earth. A parade of trucks began bringing water to the heated tanks beside the new well. From the tanks, five Halliburton pump trucks then took the water and pumped it down the well.

Problem: The water in the trucks kept trying to freeze. Their motion kept it from doing so but, when a truck stopped, it could turn into an iceberg in seconds. Solution: Perfect timing. The trucks were hooked onto the tanks almost before they stopped rolling, and their water taken out. When this couldn't be done, men opened a truck's cocks and let the water be wasted on the ground. Or they held blow torches to the truck's body to force out the water.

March 2-March 8

After 165,000 barrels had gone down the new well, nothing—nothing whatever—had happened to the fire. The boys had guessed wrong. The gas was not coming from the bottoms of the wells.

Problem: Where then was it coming from? Best hunch: A check, by means of a radioactivity device that measures hydrogen present in different layers of earth, indicated the most-likely place was 738 feet above the bottoms of the wells.

So the pipe inside the relief well was plugged at this point. And a perforating gun, lowered to the depth, fired steel bullets to open up the casing so the water would run out and flood, and (the boys hoped) this time cut off, the gas.

The water trucks again paraded to the well. On March 7, after 141,000 barrels had gone down, the gas flow became er-

[*Continued on page 250*]

If your headlamps look like these–

YOU NEED A PAIR OF NEW G-E *All-Weather* HEADLAMPS YOU'LL GET LOTS MORE LIGHT!

WATER DROPLETS inside the lens not only scatter the light, but they also help discolor metal reflectors. This can't happen with G-E *All-Weather* Headlamps—*moisture can't possibly get inside.*

DISCOLORED REFLECTORS absorb light rather than reflect it, causing a loss of up to 50% of the original light output. Dirt and moisture can never enter G-E *All-Weather* Headlamps so the *reflectors always stay shiny.*

BLACKENED BULBS in old-style headlamps block out the light from the filament and cause a dangerous drop in light output. This can't happen with G-E *All-Weather* Headlamps because *there are no inner bulbs!*

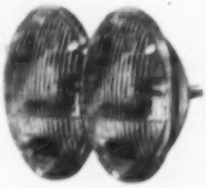
G-E *All-Weather* HEADLAMPS NOT ONLY GIVE YOU LOTS MORE LIGHT... BUT YOU ALSO GET:

Better seeing in fog, rain, snow—The lower beam filament has a special shield that cuts down reflected glare and lets you see better in any weather.

Lower beam puts twice the light 300 feet ahead at the curb—You can see much better against the glare of oncoming traffic.

Upper beam that reaches far and wide—For open road driving, the upper beam filament is left unshielded to let you see curves, dips—even side roads.

So, for safer night driving, get a pair of new G-E *All-Weather* Headlamps today — and have your dealer aim them when he puts them in. You'll see the difference tonight. General Electric Co., Miniature Lamp Dept., Nela Park, Cleveland 12, Ohio.



GENERAL ELECTRIC

SAVE $5.00

SKILSAW GREATEST SAW VALUE EVER!

6½" SAW only $49.95

special introductory offer

A sparkling-bright *new* 6½" saw. Special introductory price—**$49.95**. You *save* $5.00. Makes every cut required—even 2" lumber at 45° angle. Power-packed motor—over 1 horsepower! Exclusive "Vari-Torque" slip clutch. Foolproof lower guard. Compact. Versatile. Model 536—best buy for the money.

New SKIL ¼" Drill. Most powerful drill made for the money. Now, a full 2.5 amps. Compact. Model 549—**$28.95.**

New, rugged, ball-bearing professional-type 6½" saw. For the craftsman who wants the best. Model 552—**$64.95.**

All new SKIL Jig Saw. Full ½" stroke; maximum cut 2" lumber. Compact. Versatile. Model 511—**$42.50.**

SKIL PORTABLE TOOLS

Made only by SKIL Corporation
5033 Elston Avenue,
Chicago 30, Illinois.
In Canada:
3001 Dundas Street West,
Toronto 9, Ontario.

60 Days and Nights in an Inferno
[*Continued from page 248*]

ratic. The next day, after another 44,938 barrels, the flow was obviously dying.

March 9-March 15

The fire slowly went out. But there was still a big problem, one rarely faced in oil fields, but often faced in Canada: To get out of there—fast.

There were signs of an early spring. Spring would thaw the muskeg and turn the whole place into a swamp. The solution was obvious: In days, almost everyone had scrammed. The job of pouring down cement to check the gas permanently was postponed for a year. Trucks loaded up with equipment, hitched on house trailers, and left. "No car could haul a trailer in that terrain," Clark says. Clark himself departed in his own car, with a day to spare, before the fluid muskeg made the region impassable.

Two men were left behind to stand by. (They could move around—a little—on sand hills and spots cleared of muskeg by bulldozers.) A pipeline from one river was laid so they could flood the well if gas broke out again. (The pipeline wouldn't freeze in summer.) As it turned out, all was quiet at the well, and they never had to turn on the water.

Sometimes, when oil men tell of the Akuinu fire, they compare it to what may have been the worst previous fire the North Country ever had. That was in 1934, when 20 blocks of Nome, Alaska, were razed. The Nome fire was out in a few days. Earl Clark and the others at Akuinu had two months of fire and ice. The total loss at Nome was $1 million. The total bill for Akuinu is not in even yet. It will be greater.

But even if a wild well is nature on the loose, you don't give up on it. As soon last winter as the muskeg froze stiff again, the roughnecks swarmed back to the site of Akuinu River No. 13-36. They were drilling a new well. Even if oil didn't come, they counted on something else: to tap the natural gas for Canadian cities. They knew for sure that natural gas—lots of it—was there. END

GROBAN
FOUR-WAY OPEN CENTER
HYDRAULIC
CONTROL VALVE

ITEM #126 — Four-way open center control valve, with built-in adjustable relief valve factory set at 1000 P.S.I. Spring loaded neutral position. For use with one double acting cylinder. In neutral position cylinder is locked and pump unloaded. Can be used as single unit or mounted in series. Has ¾" pipe thread inlet and outlet. 1½" pipe thread cylinder ports. Finger grip handle. Ship. wt. 10½ lbs.

AN OUTSTANDING BUY!
F.O.B. Chicago **23.50**

SELF-PRIMING
ALL BRONZE & MONEL
GEAR PUMP

ITEM #383—USE FOR:
● Sprinkling ● Irrigation ● Insecticide Spraying ● Sump Pump ● Fuel Transfer ● Home Water Systems ● Dewatering ● Salt Water, Chemical, Acid Pumping

FEATURES ● Needle Bearing Construction ● 1½" Pipe Thread Inlet, 1¾" Hose Outlet ● Standard ¾" Keyed Shaft ● All Bronze Body & gears, Monel Shaft ● Equipped with Drain Cocks. Grease Cup. Internal Drive Gears for long, trouble free service. ● Four mounting feet.

CAPACITY: From 10 to 80 Gal. Per Min. At Speeds from 550 to 2400 R.P.M. Using from ¾ to 20 H.P. For Pressures to 250 lbs. Ship. Wt. 58 lbs. U. S. Navy Cost $168.00.

F.O.B. Chicago **39.50** Ea. Two for 75.00

SELECTED
TOP VALUE SPECIALS!
SURPLUS ITEMS AT FRACTION OF ORIGINAL GOV'T. COST
AT GROBAN'S

1½ H. P. HYDRAULIC SPEED REDUCER

Item # 115

with FINGERTIP CONTROL

USE FOR: ● Reamer Drives ● Midget Cars ● Feed Mills ● Canning Machines ● Conveyors ● Lathes ● Milling Machines ● Motor Roats ● Cream Separators ● Garden Tractors ● Pumps.

Variable output speeds from 0 to input speed available by moving control handle. Locking handle maintains setting. Use input power of ¼ to 1½ H.P. Shafts ⅝" diam. Input rotation counter-clockwise facing shaft. Input speed 750 R.P.M. Output rotation reversible. Dimensions 7½"x7½"x 11½". Shpg. wt. 31 lbs. Complete with 2 qts. of oil and full instructions. F.O.B. Chicago..... **72.50**

BELT DRIVEN
A.C. GENERATORS

Ideal for powering electric tools, oil burner, refrigerator, lights, or other appliances requiring up to 1000 watts of power. **1000 WATTS.** 115 Volts, 60 cycles A.C. 3600 R.P.M. Compact, self-regulating generator with V Belt pulley and double outlet receptacle. Rotation counterclockwise. May be driven by tractor or auxiliary gasoline engine. Requires 2½ HP minimum. Dimensions: 10" long x 8" high x 6" wide. Shipping wt. 27 lbs. F.O.B. Chicago..... **79.50**

ITEM #1010

Model 700—750 Watts A.C..... **59.50**
Model 2000—2000 Watt A.C. Generator.... **133.00**

FREE—1957 CATALOG—JUST OUT!
60 PAGES—Chuckfull of unsurpassed War Surplus and newly manufactured Equipment Bargains for farm, home, factory, workshop. Write letter today.

ORDER DIRECT FROM AD—SATISFACTION GUARANTEED
Send Payment Or Purchase Order Today
For Phone Orders Call WEbster 9-3793

GROBAN SUPPLY CO. Dept. PS-4
1139 S. WABASH AVE., CHICAGO 5, ILL.

VICKERS PISTON TYPE
HYDRAULIC PUMP

Compact
Powerful
ITEM #39

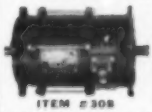
For direct or pulley drive. Rated 8 Gal. per min. at 3750 R. P. M. Delivers 1000 lbs. per sq. in. Ball bearing construction. Standard foot mounting. ½" shaft. ⅛" pipe thread ports. U. S. Air Force cost $136.00 Our low price Postpaid..... **24.95**

G.E. SEALED BEAM
300 WATTS 110 VOLTS
SPOTLIGHTS
THROWS A BEAM TO 1000 FT.

Item #418
General Electric
"Mazda" 8½"
Sealed Beam

Uses conventional 110 Volt current A.C. — D.C. Fine for lighting up driveways, signs, parking lots, displays, garages. Built for use as Flashing Signal for U.S. Navy—to stand heavy surge loads. Shipping Wt. 2 lbs. U. S. Govt. Cost $12.68 ea.
Now—EACH **2.50** Postpaid
Lots of 3—6.00 Postpaid

BRAND NEW 1 H.P.
12 Volt Electric Motor



ITEM #308

● For electric wheel chairs (Pop. Mech. design—Mar.-1953)
● For electric golf carts.
● For self-propelled scooters, children's midget cars.

Rated 1 H.P.—100 amps., 5000 R.P.M., 12 volts, D.C.—This double shaft motor of ball-bearing construction may be run on 6 volts for lower horsepower requirements.—Standard ⅝" shafts, flange mountings—Dimensions: 8"x4½"x4½". Shipping wt. 19 lbs. A real value at **12.50** F.O.B. Chicago

PAGE FOR TILLING PLOWING MOWING

FULL LINE 2 to 6 HP with complete gear drive and reverse.
Free Catalog LOW PRICES EASY TERMS Over 30 Years Experience
FULLY GUARANTEED! Over 60 attachments available!

PAGE 1916-A S. 81st Street MILWAUKEE, WIS.

FOR DEPENDABILITY—CHOOSE CONTINENTAL RED SEAL POWER

Now Available with Built-in Generator for Lighting, etc. Series AU, 2, 2½, 3 hp illustrated.

Continental Motors Corporation
INDUSTRIAL AIR-COOLED ENGINE DIV.
12800 Kercheval Ave., Detroit 15, Mich.

© 1955

ideal for self-installation

DANBURY *Rubber Tile*
PLASTIC-FORTIFIED

The Danbury Rubber Company, Inc.
Danbury, Connecticut

LIFETIME FLOORS OF BEAUTY AND COMFORT

1. Steel Back
2. Copper-alloy lining
3. Brass barrier
4. Lead-tin overplate
5. Pure tin flash plate

You see why Fleets call Sintered Copper-Leads "Mileage" Bearings!

Step by step fleet mileage is built in to Federal-Mogul sintered copper-lead engine bearings. The wonders of powder metallurgy provide the strength of copper the "softness" of lead, in perfect balance. The brass barrier assures lining stability. Lead-tin overplating assists break-in. Pure tin flash plating adds corrosion resistance. The result—a heavy-duty mileage bearing without equal! We produce millions of them for original equipment and service.

FEDERAL-MOGUL SERVICE

Division of

Federal-Mogul-Bower Bearings, Inc.

Mechanics Know . . .
that the black and red Federal-Mogul box identifies the service bearing line as modern as today's engines.

RESEARCH • DESIGN
METALLURGY • PRECISION
MANUFACTURING • SERVICE

Washing a House Saves Painting

[Continued from page 177]

off. Finally turn on the water and flush away the grime.

To minimize ladder climbing, you can add an extension handle to a hose brush. Use a long wooden floor-brush handle or a 1″ aluminum tube. Allow this to overlap the handle of your brush about 15″ or 18″ and splice the two firmly together, using strips of waterproof plastic tape.

When working on wide overhangs or other hard-to-reach areas that require the use of an extension ladder, place the ladder to one side of the area to be washed. In this way you won't have to work directly overhead, and will not wind up getting a bath along with your house. You may sometimes find it advantageous to climb the ladder and squirt water downward.

For some spots you may have to resort to scrub brush and bucket. Use a strong commercial cleaner such as tri-sodium phosphate (commonly sold at paint stores under the name of Beetsol) dissolved in hot water. Scrub thoroughly with this solution while it is still hot. If you have much to do, better wear rubber gloves to protect your hands. Flush as soon as scrubbing is completed.

Stains below copper screens are the result of a chemical reaction with the paint. Scrubbing will lighten them considerably. You can minimize future staining by washing your screens before putting them up, and by coating the wire with spar varnish to prevent oxidation. Also scrub window sills to remove accumulated dirt, which frequently runs down and stains the siding.

Don't forget the trim. Trim paints, drying to a hard, enamel-like finish, are highly resistant to fading and do not chalk as readily as conventional house paints. The trim will benefit even more than the rest of the house from frequent washings. This is best done by hand, using either a sponge or a scrubbing brush. On these glossy surfaces, working in the sun may cause unsightly water spots. So keep in the shade. END

it's NEW! it's ALL IN ONE
LEVEL·SQUARE·TAPE

Only $1.98
at your hardware store

KEUFFEL & ESSER CO.
Hoboken, N. J.

Jet King
POCKET-SIZE
BUTANE BLOW TORCH

ONLY **$1.95** WITH CHARGER

SOLDERS!
BRAZES!
FIXES LEAKS!

Every do-it-yourself and hobby fan needs this Kidde JET KING butane Blow Torch. Just the tool you've been looking for to do dozens of jobs in home or hobby . . . TV, appliance, lamp, radio or plumbing repairs . . . precision soldering, brazing or metal craft. Useful, too, for starting charcoal fires. A tiny, clean, safe charger does the job.

Each charger gives 30 minutes of intense 3500° pinpoint flame; turns on and off. Extra chargers, 39¢ per box of 2. Money back guarantee. At leading hardware and hobby stores . . . or send check or money order, we pay postage.

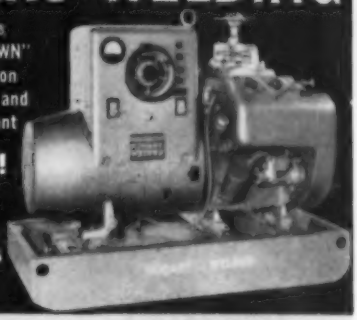
Kidde KIDDE MANUFACTURING CO., INC.
Dept. PS-4
42 Ferrand Street, Bloomfield, N. J.

Please send me _____ JET KING BLOW TORCHES plus: _____ boxes extra chargers (limit 2 boxes per torch).
My check ☐, money order ☐ for $_____ is enclosed.
Name_____
Street_____
City_____ State_____

YOU can earn BIG MONEY in ARC WELDING

with this "EASY-TO-OWN" combination arc welder and power plant

Weld! or run TOOLS LIGHTS MOTORS



Cash in ON THE BIG DEMAND FOR EMERGENCY REPAIR WORK

USE THE COUPON! No obligation.

HUSKY BOY

TRANSFORMER AC WELDER

BANTAM CHAMP

See how it pays with the new low cost Hobart welder. One of these easy to use models can become your key tool, in fact, the very method of putting you in business and more money in your pocket.

INVESTIGATE these money-makers TODAY!

200 amp. "HUSKY BOY" welds anywhere. It's light, rugged, compact—easily mounts on your tractor or trailer for traveling to emergency repair jobs. Portable mountings also available.

295 amp. TRANSFORMER AC welder for operating on single phase 220 volt power. Ideal for shops that would like to do production and repair work.

200 amp. lightweight, low cost "BANTAM CHAMP" is specially designed to let you do production and repair work in your own shop.

Write for complete details to: HOBART BROTHERS CO., BOX P-47, Troy, Ohio, Phone Federal 2-1223.

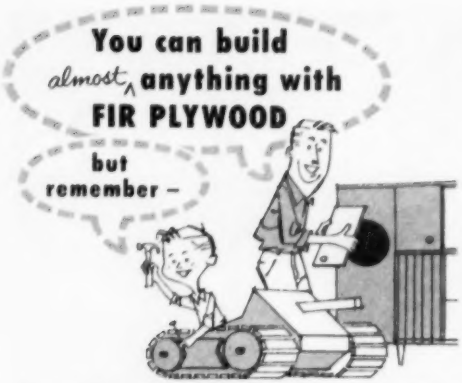
Get the valuable WELDING LESSONS BOOK $1.00
200 pages, self-teaching

HOBART *"One of the world's largest builders of arc welding equipment"*

HOBART BROTHERS CO., BOX P-47, TROY, OHIO
Without obligation, send complete details on:
☐ AC Power-AC Welder Combination ☐ Husky Boy
☐ Transformer AC Welder ☐ Bantam Champ

free ☐ Welder's vest pocket guide

Name_____
Address_____
City_____ State_____



1 - LOOK FOR THE DFPA QUALITY TRADEMARK

When you see the letters DFPA on panel you *know* you're getting plywood quality-tested to meet rigid industry standards. DFPA trademarks attest quality, performance and value.

2 - CHOOSE THE RIGHT GRADE FOR EACH JOB

Choose Exterior-type (waterproof glue) for outdoor and marine uses; Interior-type for inside jobs. Within each type are several *appearance* grades (panels with one good side, two good sides, etc.). See your lumber dealer. He'll help you choose the right grade, help with ideas and plans.

SPECIALTY PANELS include 1. *textured plywood* with smart grooved, striated or brushed surfaces for special decorative effects; 2. *overlaid plywood* (smooth, durable resin-fiber surfaces) for extra quality work.

FREE: Helpful booklets that show how to buy, use and finish plywood. Also, list of available homecraft plans. Write (USA only) Douglas Fir Plywood Assoc., Tacoma 2, Wash., Dept. 11.

Your House Is Your Savings Account

[*Continued from page 107*]

ease of becoming a homeowner. For this, the federal government is largely responsible.

As a means of combating the great depression of the 1930s by stimulating residential construction, the government, through the Federal Housing Administration, began insuring mortgage loans at moderate interest rates. In 1945 it began guaranteeing veterans' mortgages, through the Veterans' Administration.

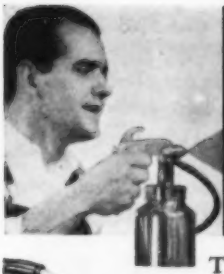
NOT only does the government still help homeowners and prospective homeowners to get loans on moderate interest terms, it also allows them to deduct the interest costs and even some home repairs on their income-tax returns.

Now, to the fact that more and more people can comfortably sing "Home, Sweet Home" with the authority of owning the home, add the fact that more and more of them are moving from home to home and are singing their affectionate tribute in new and different places.

The U.S. Census Bureau estimates that about one in every five American families, which is about nine million families, moves every year. These families move from region to region, with the general drift southwest and west; they move from country to city and from city to suburb. And in the process the large proportion of them who are homeowners cash in on their investments in their homes. (The government here provides another favor by excusing the payment of a tax on the profit in selling the old house if the family puts the money toward a more expensive home.)

To sum up: It has been made remarkably easy to own a home. Improvements and maintenance are more important than land value in determining the value of your investment. And the odds are lengthening that you will want to cash in on your investment. END

Want to get more for your housing and home-improvement money? Watch Popular Science for future articles.



Just pull the trigger . . .

spray paint!

The easier, better way to paint! Job's done in minutes. Finish is smooth, flawless. Speedy Sprayer is a real *professional tool*, favorite of craftsmen for over 35 years! At stores everywhere. 890 Outfit, including gun, hose, less motor, only $39.95

Speedy Sprayer *Wheel it to the job!*

FREE! "How to Spray" booklet and literature. Write!

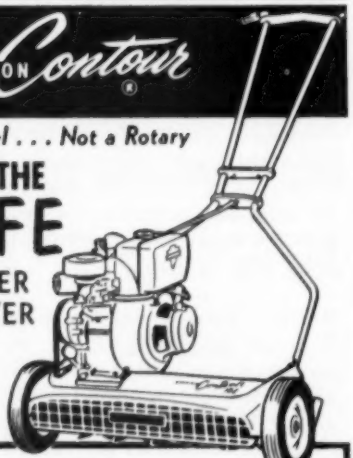
WHEEL KIT $7.50 EXTRA

W. R. BROWN CORP., 2637 N. Normandy, Chicago 35

HENDERSON **Contour**

Not a Reel . . . Not a Rotary

IT'S THE SAFE POWER MOWER



Most efficient cutter ever designed! Follows any contour, cuts anything, won't throw sticks or stones! Sharpen it yourself in minutes!

For details, please write:

HENDERSON MFG. CO.
FISHER 14, ILLINOIS

MECHANICS, MACHINISTS, CRAFTSMEN
Here's the Indicator Holder For You

NEW Starrett® No. 657

MAGNETIC BASE INDICATOR HOLDER

For quick, easy indicator setups, you want this new Starrett No. 657 Magnetic Base Indicator Holder. The off-on push button lets you position the base with one hand, leaving the other free to hold the indicator Universal adjustments including a fine adjusting screw for final adjustment simplify locating the indicator for easiest reading, greatest accuracy. The powerful permanent magnet holds firmly to iron or steel — clings to any surface in any position. Designed for use with any Starrett No. 711 "Last Word," No. 196 or No. 25 Series dial indicator.

No. 657 is only one of many new tools in the complete Starrett line. Your distributor or tool store will gladly demonstrate them or write for big, new illustrated catalog.

BIG NEW CATALOG — FREE

Describes and illustrates over 3000 Starrett Tools. Write for it. Address Dept. PS

THE L. S. STARRETT CO., ATHOL, MASS., U. S. A.
Since 1880 — World's Greatest Toolmakers

Starrett

MECHANICS' HAND MEASURING TOOLS AND PRECISION INSTRUMENTS
DIAL INDICATORS • STEEL TAPES • PRECISION GROUND FLAT STOCK
HACKSAWS • HOLE SAWS • BAND SAWS • BAND KNIVES

Your choice of Block, Strip or Ranch Plank design

Just lay *prefinished* Bruce oak flooring right over your old floors . . . no sanding or finishing

You can give your home new beauty at low cost with a prefinished Bruce Hardwood Floor. Completely finished—even waxed—at the factory, this highest quality oak flooring can be nailed right over old floors. No sanding or finishing . . . no mess or smell. Ready for use as soon as laid. Made in Strip, Ranch Plank or Block (parquet) design.

"Scratch Test" Finish — The Bruce factory-applied finish is baked into the pores of the wood. The "Scratch Test" (left) will prove to you that this durable finish does not scratch or chip or mar like an ordinary floor finish.

Moderate in cost — A new Bruce Hardwood Floor will cost you less than a good rug or carpet. Easy to keep clean and beautiful, too. It's just the thing to use in fixing up or adding a room. Let your lumber dealer give you an estimate. Mail coupon below for colorful literature.

MAIL FOR FREE LITERATURE

E. L. Bruce Co., Box 397-M, Memphis 1, Tenn.

Send complete information on prefinished Bruce Hardwood Floors.

Name.....

Address.....

City..... State.....

BRUCE **Bruce Hardwood Floors**

Product world's largest hardwood flooring maker

[*Continued from page 96*]

vice on the proper choice of studies for your youngster. If his high school lacks a guidance department, you can collect a lot of information yourself.

College catalogues, all of which give details on admission requirements, can be had for the asking.

Several large directories of colleges and universities, with a great deal of comparative information about them, are available in most public and high-school libraries.

The principal directories are: *College Blue Book* (C. E. Burckel & Assocs., Yonkers, N.Y.); *Directory of American Colleges and Universities* (American Council on Education, Washington, D.C.); *The College Handbook* (College Entrance Examination Board, Princeton, N.J.); and *Lovejoy's College Guide* (Simon & Schuster, New York, N.Y.).

2 Try to match your youngster's talents and interests with a college's specialties, including sports. One college may have a fine English department and an outstanding undergraduate orchestra. Another may specialize in physical sciences and have a strong debating team. Remember, that though grades count more than any other single factor in getting your youngster into college, extracurricular activities in high school are also considered carefully by admissions officers.

3 Have your youngster take College Board examinations, for practice, in his junior year in high school. The grades won't count unless he and you want them to, but they will give you both a good idea of how well he will do if he has to take them in his senior year.

Only one-tenth of the 1,852 U.S. colleges and universities require applicants to pass College Boards, but every college is glad to have a College Board score as a yardstick in judging an applicant. A high grade is a big help in getting into any college.

[*Continued on page 258*]

Hone-sharpens everything — from Awl to Zax*

LECTRO-HONE'S gentle honing action makes all cutting edges "surgically sharp". Perfect for every home, hobby and commercial sharpening chore. A rugged electric motor turns LECTRO-HONE'S quality oilstone at ideal speed for best sharpening action . . . never damages tempered steel or leaves "saw" edges like old-fashioned sharpeners. Smart modern styling. Buffing attachment also available for polishing fine silver, etc. Priced at $19.95.

LECTRO-HONE

For Knives, Scissors, Tools

*Zax: a tool for cutting and punching shingles.

ORDER BY MAIL under money back warranty.

WARREN SALES CO. Box 161A, Cranford 4, N. J.

Manufactured by E. F. Britten & Co., Cranford 4, N. J.

FREE CATALOG

when you BUILD or REMODEL...order your materials direct from *Pease*

FREE 136 page illustrated CATALOG

Over 1000 items—doors, windows, panelling, garage doors, kitchen cabinets, roofing, siding, flooring, mantels, cabinet work, lamp posts, sliding doors, garages, etc. — leadership in quality for 64 years.

All items are illustrated, priced and described—like a carpenter's handbook.

DON'T BE WITHOUT THIS CATALOG IF YOU ARE BUILDING OR REMODELING.

Pease WOODWORK COMPANY

1645 Blue Rock St., Dept. G-4 Cincinnati 23, Ohio

Gentlemen: Please send me FREE 136 page PEASE PRICER at once.

PRINT NAME _____

ADDRESS _____

CITY _____ STATE _____

Superior's New Model 70 UTILITY TESTER®

FOR REPAIRING ALL ELECTRICAL APPLIANCES MOTORS · AUTOMOBILES · TV TUBES

AS AN ELECTRICAL TROUBLE SHOOTER THE MODEL 70:

• Measures A.C. and D.C. Voltages, A.C. and D.C. Current, Resistances, Leakage, etc. • Will measure current consumption while the appliance under test is in operation • Incorporates a sensitive direct-reading resistance range which will measure all resistances commonly used in electrical appliances, motors, etc. • Leakage detecting circuit will indicate continuity from zero ohms to 5 megohms (5,000,000 ohms) • Will test Toasters, Irons, Broilers, Heating Pads, Clocks, Fans, Vacuum Cleaners, Refrigerators, Lamps, Fluorescents, Fans, Switches, Thermostats, etc. • Will test all TV tubes for open filaments, inter-element shorts, burned out tubes, etc. (Will not test TV tubes for quality. An emission type tester such as the Model TV-11 described below is required to test tubes for quality).

AS AN AUTOMOTIVE TESTER THE MODEL 70:

• Tests both 6 Volt and 12 Volt Storage Batteries • Generators • Starters • Distributors • Ignition Coils • Regulators • Relays • Circuit Breakers • Cigarette Lighters • Stop Lights • Condensers • Directional Signal Systems • All Lamps and Bulbs • Fuses • Heating Systems • Horns • Also will locate poor grounds, breaks in wiring, poor connections, etc.

Handsome round-cornered molded bakelite case, 2⅛"x9⅛"x2¼". Complete with all test leads. Also included is a 64 page book giving detailed instructions, for testing all electrical appliances, automotive equipment, TV tubes, etc. Only **15.85**

Superior's New Model TV-11 STANDARD PROFESSIONAL

TUBE TESTER

Uses the new self-cleaning Lever Action Switches for individual element testing.

Because all elements are numbered according to pin-number in the RMA base numbering system, the user can instantly identify which element is under test. Tubes having tapped filaments and tubes with filaments terminating in more than one pin are truly tested with the Model TV-11 as any of the pins may be placed in the neutral position when necessary.

The Model TV-11 does not use any combination type sockets. Instead individual sockets are used for each type of tube. Thus it is impossible to damage a tube by inserting it in the wrong socket.

Free-moving built-in roll chart provides complete data for all tubes.

Phono Jack on front panel for plugging in either phones or external amplifier will detect microphonic tube or noise due to faulty elements and loose external connections.

Operates on 105-120 Volt 60 Cycles A.C. Hand-rubbed oak cabinet complete with portable cover **47.50**

SHIPPED ON APPROVAL

NO MONEY WITH ORDER — NO C.O.D.

Try either of the above instruments for 10 days before you buy. If completely satisfied then send down payment and pay balance as indicated on coupon. No Interest or Finance Charges Added! If not completely satisfied, return unit to us, no explanation necessary.

MOSS ELECTRONIC DIST. CO., INC.
Dept. O-335 3849 Tenth Ave., New York 34, N. Y.

Please rush the unit(s) checked. If satisfied, I agree to remit the down payment within 10 days and to pay the monthly indicated rate. If not satisfactory, I will return within 10 days for cancellation of account.

☐ Model 70. . . . Total Price $15.85 —$3.85 within 10 days. Balance $4.00 monthly for 3 months.

☐ Model TV-11. . . . Total Price $47.50—$11.50 within 10 days. Balance $6.00 monthly for 6 months.

Name.....

Address.....

City.....Zone.....State.....

All prices net, F.O.B., N.Y.C.

Can Your Youngster Get into College?

[*Continued from page 256*]

4 Help your youngster narrow the field of his choice of colleges as much as possible.

If he has made up his mind about a career, his choice of colleges will automatically be reduced, because all subjects are not taught in all colleges, or even in one college.

For instance, if he wants to study science or engineering, a lot of small colleges will be out of the question. Many of them do not have the equipment or the faculty to teach more than introductory courses in these fields.

One solution is to have your youngster apply to a liberal-arts college first, with the intention of transferring to a technical college later. Many liberal-arts colleges have formal cooperative arrangements with technical colleges, usually involving a five-year course of study.

Be realistic in surveying the college field. Your youngster will stand the best chance of getting into a college that usually takes students of about his level of ability. If you permit your son or daughter to shoot too high, you may cut down the chances of acceptance or, if accepted, the chances of getting through.

Here again, your youngster's high-school guidance department or his teachers can best advise you as to where he should apply. If you have questions that they can't answer, consult the admissions officers of nearby colleges or universities. Or talk with local alumni of the colleges you and your youngster have in mind, or with local members of whatever profession your boy or girl is thinking of entering.

Here are additional sources of information: the six regional college-accrediting agencies, whose addresses are given in most educational directories; the Council for the Advancement of Small Colleges, 726 Jackson Place, N.W., Washington, D.C.; and the American Association of Collegiate Registrars and Admissions Officers, addressed c/o Registrar, Miami University, Oxford, Ohio.

[*Continued on page 260*]

MODERNIZE WITH MARLITE

...takes years of wear, minutes of care!

Easy-to-handle Marlite paneling—in luxurious wood finishes, distinctive marble and plain-color patterns—will give any room in your home an exciting new personality. Quickly installed over new walls or old, Marlite eliminates plastering, painting, papering. And the melamine plastic finish shrugs off scuffs, grease, moisture; cleans with a damp cloth. This weekend, finish a room with Marlite. See your lumber dealer, or send 10c for 16-page, full-color decorating book to Marlite Division of Masonite Corporation, Dept. 426, Dover, Ohio.

Guaranteed by Good Housekeeping

Marlite® plastic-finished WALL and CEILING PANELING

ANOTHER QUALITY PRODUCT OF MASONITE® RESEARCH

MAKE STRIPES with *new* PAINT PEN

Straight, curved, single or double
With any color paint, stripe furniture, bikes, autos, model planes, toys, linoleum, wallboard. Clean, crisp decorative lines. Can't clog or smear. Also use with glue, tempera, textile paint or underglaze . . . on wood, glass plastic, ceramics, metals, fabrics and paper. Ask your dealer or order direct.

DEALERS Master paint striping tool in display carton. Write for discounts.

HOBBY "Professional" results every time. Simple, easy to use. Order now.

MFRS Ask about heavy duty industrial striping tools.

DOUBLE STRIPE MODEL & COMBINATIONS. . . . $3.25

Single 1/16" stripe model $1.25

Other single stripe models $1.75 EA. 1/64", 1/32", 3/64", 5/64", 3/32" & 1/8"

Complete Kit (all 7 tips) $5.00

Extra tips 90c ea.

Extra 1/4" tip..$1.20

WENDELL MFG. CO. 4234 LINCOLN AVE., Dept. 228 CHICAGO 18, ILLINOIS

ROTO-HOE

FAST, SMOOTH-HANDLING, EASY

Makes Gardening FUN!

ROTO-HOE doesn't jump around, doesn't have to be jiggled, joggled, and bounced along. It's smooth, easy, pulls itself along. You'll enjoy growing fresh vegetables and beautiful flowers—without backaches, weeding problems—ROTO-HOE tills, cultivates between the rows, helps you have a better garden, more time to relax. Complete 2 h.p. ROTO-HOE only **$129.50.** 22" Self-Propelling ROTO-CUTTER and many other low-cost attachments use same power unit, change so quickly. Write for FREE color folder, nearby dealer's name.

ROTO-HOE & SPRAYER CO., Dept. P-18, Newbury, Ohio

your best buy...

- stretches the years between painting . . .
- right paint for every type of surface . . .
- endorsed by leading painters . . .

FREE! Beautiful 44-page "Home Decorator" book. At your dealer, or write The Sherwin-Williams Co., 1238 Midland Building, Cleveland 1, Ohio.

SHERWIN-WILLIAMS

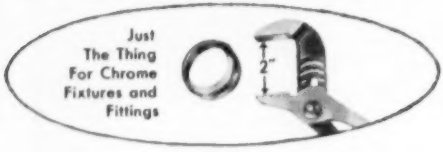
HOUSE PAINT

At Last!

A "TOOTHLESS" PLIER THAT GRIPS WITHOUT GOUGING

CHANNELLOCK®

No. 415 Smoothjaw PLIER



One of the handiest tools you'll ever use . . . the new "toothless", smoothjaw plier that grips without gouging. Just the ticket for gripping chrome-plated fittings, plastic, wood and other smooth surfaces. Especially handy on chrome sink-fixtures and other hard-to-handle jobs. Jaws quickly adjustable to full 2" opening. Get yourself a Channellock No. 415 Smoothjaw Plier. You'll find it's "the right tool" on scores of jobs in home and shop.

Ask Your Hardware Man For A CHANNELLOCK Smoothjaw PLIER

MADE ONLY BY

CHAMPION DEARMENT TOOL CO.
MEADVILLE, PENNSYLVANIA

Can Your Youngster Get into College?

[*Continued from page 258*]

Helping your daughter make a selection of colleges is harder. There are fewer colleges for girls than for boys. There are fewer dormitories for girls than for boys in co-educational colleges. There are fewer scholarships and fewer student-job opportunities. In addition, some colleges have slightly higher board-and-room charges for girls.

On the plus side, though, is the fact that several colleges for women only, particularly in the Midwest, are still hungry for applicants.

If your daughter wants to go to a co-ed college that has limited dormitory space, you can perhaps get around this by having her live with a relative nearby and enroll as a day student.

5 Take your youngster to visit the campuses in which he is particularly interested. It makes a favorable impression on a dean when a prospective student and his family come to the college to talk over applying for admission.

If you live too far away to make a campus visit practical, arrange for your child to talk with a local alumnus of the favored school or with a traveling representative of the college.

6 Have your youngster apply to three or four different colleges in the area of his choice. But don't let him use mimeographed forms in applying, as some youngsters do. Each college wants to admit only those youngsters who really have their hearts set on that particular school. Though the college authorities realize that there is a good chance that each applicant has tried a few other places, they don't relish the impression that he has tried so many colleges that he couldn't take the trouble to fill out individual forms.

7 Consider these ways of beating the competition. If your youngster is not at or near the top of his high-school class, his chance of getting into college

[*Continued on page 262*]

NEW!

SHAW

RM 24 MOWER WITH AMAZING MAGIC DRIVE

Three Speeds forward neutral & reverse

Wide range of speeds, complete gear selection gives you outstanding mowing control for any terrain, any type mowing. Low cost!

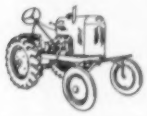
3 sizes, cut 24, 32 and 36".

Riding Mowers 2½ to 8 H.P. low as **$199.00**
Riding Tractors 3 to 14 H.P. low as **$299.00**
Walking Type Tractors 2 to 5 H.P. low as **$99.00**

Bargains in Rotary Pulverizers also.

See your Shaw dealer or write for free literature.

Dealer inquiries invited.



SHAW Manufacturing Company

5704 Front Street, Galesburg, Kansas
668-P4 N. 4th Street, Columbus, Ohio

ELECTRIC WELDER AC or DC 110 Volt

The "Little Marvel" all-metal welder 5-year written guarantee. Welds ⅛" metal or money back. Repairs tanks, tools, fenders, machine parts, etc. Complete with everything—rods, unit, eye shield, directions. $7.95 plus 50c postage. Flame torch accessory for soldering, cutting, brazing $3.95 complete with carbons, brass rods, flux. $2.00 deposit on C.O.D. 75 Ampere ¼ inch Transformer Welder $24.95 F.O.B.

$7.95 Complete

ESSAY MFG. CO., Dept. 47, Quincy 69, Mass.

NEW! LET YOUR DRILL SHARPEN ITS OWN BITS

Grinds round shank drills from 3/32" to ½" like new in 4 drill point angles. Fits all portable drills; converts drill motor to bench grinder. Complete Kit No. 32 includes stand, sharpener, drill clamp, 4" grinding wheel, arbor ..... **$8.95 PPD.**

Sharpening Attachment only.....$2.95 PPD.

SAW SHARPENING IS EASY

Super Filer No. 11 joints and sharpens hand and circular saws 6" to 10" with all teeth correct in height, depth, pitch, bevel. When file hits hardened steel roller, teeth are finished. Saw runs true with no side pull. Includes 8" file. **$9.95 PPD.**

"TRU-CIRCLE" saw set automatically sets teeth at 10° or more. **$2.95 ppd.**

NEW! SUPER SAW FILER NO. 6

Automatically controls depth, angle, pitch for all saws. Precision made and calibrated. Use in any vise or clamp. Includes file. **$6.50 PPD.**

MONEY BACK GUARANTEE—FREE CATALOG

A. D. McBURNEY, 5908 Hollywood Blvd.
Hollywood 28, Calif., Dept. S-47

REPLACE YOUR

OLD WOOD CELLAR DOOR

WITH A MODERN ALL-STEEL BILCO DOOR

DO IT YOURSELF

IN JUST 3 TO 4 HOURS

Think of it! Only a few hours of pleasant work to replace your unsightly, troublesome wood hatchway with a lifetime, weathertight BILCO . . . the door installed on tens of thousands of new homes.

PAYS FOR ITSELF! Cost so little, yet never needs repair or replacement. Operates at a touch. Smooth, trim appearance adds amazing new beauty to your home.

Rush coupon TODAY for free folder "How to replace your wornout wood hatchway" showing sizes and prices.

Bilco®

AMERICA'S FINEST BASEMENT DOOR

THE BILCO CO.
DEPT. 920C
NEW HAVEN, CONN.

Gentlemen: Please send me free folder and name of nearest dealer.

Name_____

Street_____

City_____ State_____

Can Your Youngster Get into College?

[Continued from page 260]

will be much improved if he applies to:

- A Midwestern college or university, rather than one on either coast. Midwestern institutions, as a whole, are least full. Those in the East are most crowded, and those in the Far West are not far behind.
- A college far away from home, rather than nearby. Most private colleges try to maintain a geographic cross-section among their undergraduates, and they receive the fewest applications from the greatest distances.
- A little-known college, rather than a prominent one.
- A new college, rather than a well-established one. Some institutions are starting new branches and some states are going to build entirely new universities. These are eager to get students at the beginning.

New York State, for instance, is planning a new senior college on Long Island. The University of Illinois is planning a new four-year branch in the Chicago area. MacMurray (in Jacksonville, Ill.), a high-ranking girls' college, is starting a coordinate college for men, using its present experienced faculty.

- A two-year college, rather than a four-year college. Drop-outs and flunk-outs at four-year colleges leave room for transfers who could not be accommodated as freshmen. Several states already have, or are building, networks of community junior colleges.

Above all, don't give up trying because the competition is fierce. On the other hand, you can't afford to be complacent. It will take earnest teamwork between you and your youngster to enable him to get into college, and it must be begun early. But this cooperation in a quest so desirable to you both is bound to create a warmer, more satisfying relationship between you and your youngster. END

ANSWERS to exam questions on page 96:
1. (B) 2. (D) 3. (E) 4. (D) 5. (B) 6. (D) 7. (B) 8. (D) 9. (D) 10. (A) 11. (D) 12. (E) 13. (C) 14. (A) 15. (B) 16. (C).

AS A

TUNE-UP*

- frees sticky valves
- increases pick-up
- improves performance

*through air intake or add to gasoline

ADDED TO

MOTOR OIL

- cleans out engine
- increases power
- gives quick starts

☆ At your service station, garage or accessory store

SATISFACTION GUARANTEED OR DOUBLE-YOUR-MONEY-BACK

HASTINGS MANUFACTURING CO.
HASTINGS, MICH.

Also makers of H-W-R, Piston Rings, Oil Filters, Spark Plugs

COUNTRY SQUIRE TRACTOR *with* ROTARY, REEL TYPE or SICKLE MOWER

CUT GRASS THE EASY WAY

ALSO plows, harrows, cultivates, plants, rakes hay, sprays, bulldozes, plows snow, saws cord-wood. Write for FREE CATALOG

COUNTRY SQUIRE TRACTOR CO.
P.O. Box 107, A-4A
Muskego, Wisconsin

ENDS STUCK DRAWER NUISANCE FOREVER!

Roll-eez®
SET "A"
ROLLER BEARINGS FOR WOODEN DRAWERS

- EASY, QUICK to INSTALL in FURNITURE, BUILT-INS
- MAKES WOODEN DRAWERS OPERATE SMOOTHLY EVEN IN HOT, HUMID WEATHER

Stop breaking your back trying to open that stuck drawer! Sensational Roll-eez Set "A" cures the cause of stuck drawer troubles by eliminating friction of wood-against-wood and maintaining drawer alignment. Made of noiseless, self-lubricating NYLON rollers mounted on steel frames. Each drawer set includes simple instructions and nails. Anyone can install. Used by cabinetmakers to provide lasting convenience in homes of every price range. At Hardware, Building Supply dealer. If he does not stock, remit to factory.

Action Compares with Costly Slides

Nail two Roll-eez "N" to rail at drawer opening. If drawer has center guides, nail third Roll-eez "N" on rap of back in middle, and Roll-eez "M" on bottom of back, straddling guide.

49¢ SET FOR ONE DRAWER

Set "A"

JOBBERS DEALERS WRITE

Building, Remodeling? Ask Builder to Equip Cabinets with Roll-eez. So inexpensive.

Junior-Pro Prod. Co., Dept. P 118 E. Marceau St. Louis 11, Mo.

...makes paint removing EASY

Just spread it over the surface with a paint brush. Softens any finish right down to the wood or metal. Use on furniture, woodwork, trim—indoors or out. Will not run on uprights. At paint and hardware stores. Over 5 million cans sold—long a favorite of painters.

● ***Write for free Wonder-Paste folder***

or send 25¢ for illustrated Manual on Refinishing.

Wilson-Imperial Co., 121 Chestnut St., Newark 5, N. J.

NOW! CUT ALMOST ANYTHING

with WISS "Mighty Midget" Snips!

No. V-13

ONLY $2.10! "Mighty Midget" Solid Steel Snips fit easily into your pocket or fishing tackle box. Make straight and curved cuts. At leading hardware and tool stores. Get a pair soon!

OTHER WISS SNIPS FOR HOME, FARM, AND PROFESSIONAL CRAFTSMEN

CIRCULAR and STRAIGHT CUT $2.80 and $3.80

Versatile as "Mighty Midget" snips. 10" model cuts 24 gauge metal; 13" model cuts 21 gauge.

REGULAR $2.35 to $3.50

For powerful straight cutting. Four different sized models. Good for all sheet metal work, 25-20 gauge.

METAL MASTER M-3 $4.25*

Tremendous power! Only 10" long. Make intricate straight or curved cuts in 18 gauge metal, with half the normal effort!

* Slightly higher in Denver and West. Vinyl handle grips optional and extra.

J. WISS & SONS CO., NEWARK 7, N. J.

WISS . . . always a cut above competition

Facts on the '57 Power Mowers

[*Continued from page 103*]

The typical rotary cutter looks simple but isn't. It is a steel bar, the two leading edges sharpened for the last few inches of their length. These edges slice off the grass on the front half of the swing.

Lift. Back edges of the blade are curved, fan-like, to blow air upward. The suction lifts the grass up straight so that it is all sliced off evenly. The amount of "lift" designed into the blade is important: too little and you get a ragged cut, too much and you blow dust all over the yard. Strangely, the lift curve wears down (from hitting dust and sand in the grass) about as quickly as the cutting edge does. That's why a freshly resharpened blade may not cut as smoothly as you think it should. (Replacement instead of resharpening is the answer; the blades are cheap.)

The rotary cutter is fastened directly to the engine shaft. If the cutter hits a stone, the shock is transmitted to the shaft. Usually there's some provision for slippage—perhaps a fiber washer between the cutter and its fastener. Just how much protection this "slip clutch" provides is debated in the industry.

Some cutters are made in sections: A short bar is fastened rigidly to the engine shaft, and blades are attached lightly to the ends of the bar. Theoretically, at least, an obstruction would make the blades pivot back and little shock would get to the engine shaft. Jacobsen extends this idea by using small, pivoting blades at the edge of a bowl-shaped "rotor." The rotor provides lift suction as well as protection to the engine shaft.

Clippings. A reel mower throws big fat clippings up and back, where you can collect them in a grass catcher, rake them up later, or just leave them.

Rotaries? Well, the advertisements say that the blade grinds up clippings into a fine mulch which sprays out to disappear into (and enrich) your lawn. It does, too—so long as the grass is good and dry. It may not do that so well,

[*Continued on page 266*]

your best buy in a paint sprayer

Pressure Maid is the most efficient small portable paint sprayer on the market . . . bar none. *Piston-type* . . . not a diaphragm. Direct drive! Rugged, compact one-cylinder air tool for home craftsman without special skill. Precision-built. Trouble-free. *Complete!* Sprays paints, varnishes, enamels, insect sprays. One job pays for it.

Write 151 Railroad Ave., Harrison, Ohio *naming dealer*

CAMPBELL-HAUSFELD

WELD **BRAZE** **SOLDER** **CUT**

4 WAY WELDER

ONLY $14.75 f.o.b. factory

Complete with Twin Carbon Arc Torch and accessories . . . to handle all metal-craft work.

Acclaimed by thousands of Homeowners, Mechanics and Hobbyists as the welder of 1001 uses. Easily operated from properly wired 110 volt AC or DC line. **The ideal gift with a life-long use** . . . Order today on 10-day money-back guarantee

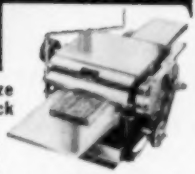
FOUR-WAY WELDER CO., Dept. F3-D
1810 S. Federal St. • Chicago 16, Ill.

Jarco LAWN TRACTOR

Do your lawn and garden chores the easy way with a Jarco Tractor. Big and rugged enough for dad; small and safe enough for junior. Automotive type differential and transmission with two speeds—Forward and Reverse. 21" and 30" clean cutting front mounted mowers with universal hitch. Low Factory Prices. Write for free literature.

J&R MFG. CO., Box 213, Laceyville, Pa.

SAVE MONEY on LUMBER with the LOW-COST BELSAW PLANER



• Convert Rough and Random Size Lumber Into Cabinet Finished Stock

Now anyone can make perfect cabinet finished stock from low-cost rough lumber. . . any size up to 12¼ inches wide and 6 inches thick. Turn out high grade finished material at a fraction of the cost you pay lumber yards. Big 42-inch-long bed makes it easy to plane heavy, wide and long pieces . . . BELSAW self-feeds at 14 to 34 feet per minute.

USE THIS ONE LOW-COST MACHINE for Planing, Jointing, Sawing, Milling, Tongue and Groove.

You can easily make flooring, siding and many other popular patterns with your Belsaw. Your Belsaw quickly pays for itself with savings on raw materials and profits on finished stock . . . a highly profitable machine for custom work. Compare Belsaw with any 12-inch planer on the market . . . Belsaw gives you more essential features—yet costs you $50 to $125 less than others.

Send Today for Free Literature on the Belsaw Multi-Duty Planer.

BELSAW MACHINERY CO 2067 Field Bldg. Kansas City 11, Mo.

NEW
JET ROCKET
ONLY $3.95

Built like the famous original ROCKET hammer, the tubular boron alloy steel handle won't bend or break. It's permanently locked to jet-black head. Black cushion grip soaks up shock, won't slip wet or dry or in gloved hand. Ask to see all the JET ROCKETS at your hardware store today. True Temper Corp., Cleveland 15, Ohio.

BELT AXE, AND HATCHET ALSO AVAILABLE IN **JET ROCKET** MODELS

TRUE TEMPER®

Finest quality in Hammers, axes, hatchets Shears • Shovels • Garden, lawn and farm tools • Fishing tackle • Golf-club shafts

Facts on the '57 Power Mowers

[*Continued from page 264*]

though, if the grass is wet. Sometimes wet clippings clump together, then blurp out to give your yard the messy look of a sheep pasture. Or they may stick to the inside of the housing, clog the discharge opening and build up until the engine stalls trying to push the blade through the packed mass.

Every mower man we talked to admitted that This Is a Problem. Some blades have right-angle projections at their tips; these are supposed to scrape clumped clippings free.

The design of the housing seems to influence clumping most, but no sure-fire shape has been found. One expert thinks that the space above the cutter bar is critical. It should be large enough, he says, to keep the clippings suspended in air as a spray that can leave the housing easily, but small enough to make the air stream move at high velocity.

Body. The housing enclosing a rotary cutter has to support a heavy, vibrating engine and also shield you against flying fragments of stones, sticks—or broken blades. So, strength is an important consideration. Stamped steel—if it's thick enough—is sturdier than cast aluminum. But the better rotaries usually have aluminum decks because the customers prefer their lighter weight (they can also be made to look prettier). These are probably as strong as the 14-gauge steel that is commonly used.

The weight of the mower is one factor in ease of pushing, but the size of the wheels and the quality of their bearings are more important. The bigger the wheels are (rear ones particularly), the better—Yazoo uses 16-inch bicycle wheels. Many mowers have staggered wheels, which help them cross uneven ground without tilting.

Power drive. A rotary mower needs no transmission, unless you want the engine to drive the wheels. Then things get complicated and expensive.

The trouble is this: The engine output has to be slowed way down, and then

[*Continued on page 268*]

FOR YOUR HOME, YARD and SHOP PROJECTS

nichols NEVER-STAIN RUSTPROOF

ALUMINUM Nails

Guaranteed by Good Housekeeping

LOOK FOR THIS RED & WHITE DISPENSER

- Will never rust streak or stain
- Solid aluminum — no coating to chip
- Easy to drive — made of hard aluminum alloy
- Etched for great holding power
- Available in 10 popular types and sizes in reuseable plastic boxes

Also available in "Packaged-for-the-job" dustproof containers. At your hardware, building and lumber supply dealer.

nichols WIRE & ALUMINUM CO. DAVENPORT, IOWA
World's Largest Manufacturer of Aluminum Nails

if you have to glue it . . .

LET ELMER DO IT!

Repair or build quickly with strong ELMER'S® GLUE-ALL

Be a real home "do-it-yourselfer." Build this fold-away work bench easily from Easi-Bild pattern #576 with Elmer's Glue-All. It's easy to apply, fast drying. Glue-All is also ideal for dozens of other uses around the home. Bonds any porous material such as wood, pottery, paper or cloth.

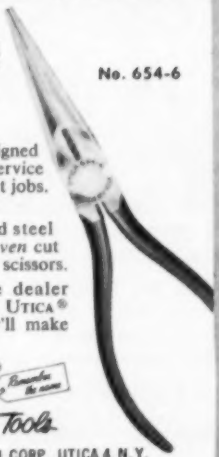
Send 50¢ in cash or money order for full-size Easi-Bild* Fold-away Bench Pattern No. 576 to Elmer's Pattern Dept., P. O. Box 26, Pleasantville, N. Y.

*T. M. Reg. Easi-Bild Pattern Co., Inc.

A Nose for Action

...Yes, there's real action in UTICA's® Long Chain Nose Cutting Pliers.

No. 654-6



They're specially designed for year in, year out service on those hard-to-get-at jobs. And they stay sharp!

They'll cut tempered steel wire in a snap—will *even* cut paper like a pair of scissors.

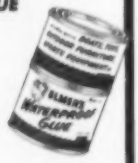
See your hardware dealer today. Just ask for UTICA® No. 654 Pliers—they'll make your work easier!

UTICA® Tools

UTICA DROP FORGE & TOOL CORP., UTICA 4, N.Y.

Get a completely waterproof bond with ELMER'S® WATERPROOF GLUE

It's the glue that boating experts use. Apply on any joint subject to water, weather, acids or alkalis. Super bond is stronger than wood itself!



Bond plastic laminates or plywood wall panels with ELMER'S® CONTACT CEMENT

No clamps, nails or presses needed to do professional job quickly. Highly resistant to heat and water. Available in regular or *non-flammable* type to meet every need.

IF IT'S *Borden's* IT'S GOT TO BE GOOD!

The Borden Company, Chemical Division

©1957, The Borden Company

NEW! DISCOVERY!

SAVES PLUMBING BILLS

CLEANS INSTANTLY

CHICAGO—April 1st—Home Owners, Offices, Apartments, including Factories are constantly having trouble with clogged-up pipes which proves expensive in Costly Plumbing Bills—

But now—using Water Impact and Air Pressure, here is a new unit called the **Plumber's Flushing Gun,** which cleans all lines up to 100 ft. It will open any number of bends in pipe. Yet anyone can operate this new gun, which triggers easily.

TOILETS, URINALS, SINKS, and FLOOR DRAINS clogged with paper, grease, rags, sand, and other debris can be cleared with one or more shots from the gun, **saving the owner, the Gun's price the first time it is used.** This new Flushing Gun may be used on any ½ to 6 inch waste pipe including Sink Drains, Floor Drains, Hot Water Pipes, Drinking Fountains, Septic Tanks, and Urinals. Obstructions melt away INSTANTLY when struck by the hammer like blow of this new unit.

AMAZINGLY EFFECTIVE a hose attachment from the faucet (not shown here) leads water thru the Gun and pipe while at the same time air is released causing a Powerful Chain reaction.

This New Flushing Gun is offered on 30 Days Free Trial. BUT MOST IMPORTANT IS THIS—What is this Tool worth in **Costly Plumbing Bills** Saved in your Home or building? For your own good—Tear this Ad out now and write your name and address beside Ad for **FREE BOOKLET.** No agent will call—Obey that urge, mail now or write postcard. (Chicago Phone Kildare 5-1702) **MILLER SEWER TOOLS, DEPT. PS-R, 4642 N. CENTRAL AVE., CHICAGO 30, ILLINOIS.**

NEW! Evans POWER-TAPE

No More Pushing Blade Back Into Case!

Here's the greatest single mechanical advance in steel tape history! Press the button gently with your thumb — blade returns smoothly. *You control the speed.* Release the button—blade stops instantly. No "creep," no lost measurements! Chrome-plated case, GIANT sliding end hook — for inside-outside measuring. White steel blade, marked in inches *and* feet-and-inches—no figuring! Free Tenite carrying case with magnifying lens.

Only $1.69 (10 ft.)

Unconditionally Guaranteed
6, 8, 10, or 12 ft. lengths
Get POWER-TAPE *today!*
Available only at hardware stores

Evans RULE CO. Elizabeth, N. J. Montreal, Que.

Facts on the '57 Power Mowers

[*Continued from page 266*]

led around a corner, from the vertical shaft of the engine to the horizontal shafts of the wheels. To accomplish this, manufacturers use everything from twisting belts and rotating disks to automotive differentials. Some drive the rear wheels (better traction); others drive the front ones (easier to turn or pull backward—you tip the drive wheels off the ground). Few small rotaries have powered wheels, and none of these are listed in the PS chart.

It's another story with reel mowers. There is no corner for the power to turn and you need a transmission to spin the cutter anyway. The wheels can be geared directly to the cutter, as in a hand mower, or driven by a second power train.

Chain or gear drives are more positive than belts, which may slip if grass gets into the pulleys. Some slippage in the cutter drive, however, is advantageous, since it protects the blades from serious damage when they jam on a stick or stone. For this reason, gear or chain arrangements may include slip washers. Guards that completely enclose chains or belts are very desirable safety features.

Clutches. The friction or automotive type of clutch will probably require less fussing than the simple movable pulley that tightens a drive belt.

Location of the clutch in the drive train also makes a difference on a reel mower. If it can disengage the wheels while the cutter revolves, you can mow around shrubs more easily. Two independent clutches are even better; then you can disengage the cutter and let the wheels drive the mower into the garage.

Service. Unless you are on intimate terms with carburetors and magnetos, you will need service for your mower as much as for your car. Find out, *before* you have trouble, where you can get it repaired. It's a good idea to quiz friends and neighbors about the quality of work turned out by the shop you have in mind. If the shop is distant or its service sloppy, better look some more. END

50% OFF on National's NEW 1957 22" Rotary Power Mower

3 H.P. Clinton 4-Cycle or Briggs & Stratton Engine with Recoil Starter

Mfr's. List Price $139.75

69.50 Delivered

FREE Leaf Mulcher

- **LIFETIME GUARANTEE** – All Steel Unbreakable housing
- Cuts full 22" Swath • Automatic Governor • Trimming action on both sides of mower • Double Discharge chutes
- Adjustable cutting height, 1" to 3" • Saber Steel blade, detachable, reversible • Shockproof clutch, protects blade
- No shimmy – no vibration • Full floating handle.
- **LAY-AWAY PLAN** – $10 deposit – reserves mower until needed – State date. Balance, C.O.D.
- Pay in full, receive an **extra FREE bonus** – 50 ft. Plastic Garden Hose. Value $4.95
- **Guaranteed Satisfaction** for 90 days after delivery.
- **Money-Back Guarantee** – return unused within 10 days.

NATIONAL FARM EQUIPMENT CO., INC.
142 GREENE ST. • Dept. 21 • NEW YORK 12, N.Y.

DO EVERY FASTENING JOB 10 TIMES FASTER!

Amazing one-hand operation, 10 times faster than hammer & nails. Can't jam.

ARROW

DO-IT-YOURSELF TACKER, No. T-50

for ceiling tile, insulation, wire fence & every home job.

At your local hardware dealer or lumber yard

Arrow Fastener Co., Inc., 1 Junius St., Brooklyn, N. Y.

the finest **FLOOR POLISHERS** *are* **Red Devil Tools.**

WOODWORKERS CONSTANTINE'S CRAFT SUPPLY CATALOG . . .

CONSTANTINE has supplied woodworkers, craftsmen and industry for over 145 years at America's lowest prices. This manual is new from cover to cover. Contains many items not available elsewhere. Tells how to veneer, make inlays and inlay pictures. Lists over 3,000 hard-to-get hardware and craftsmen items. Section on hand and power tools. Invaluable do-it-yourself book. Send 50¢ now to pay mailing and handling (refunded on first order).

136 pages — shows rare and fancy woods and inlays in full color. Carvings, hardwoods, veneers, moldings, plywoods, plans, inlaid pictures, prunelle, hardware, upholstery items, finishing materials. Everything for any hobbyist.

50¢

ALBERT CONSTANTINE AND SON, INC.
2054-J EASTCHESTER ROAD, NEW YORK 61, N. Y.

Learn these new skills . . . with all-purpose BERNZ O MATIC® TORCH KIT

BRAZE AND SOLDER . . . kit includes soldering tip and high-heat burner units . . . you can also sweat copper fittings . . . fix appliances . . . make jewelry . . . repair gutters.

CUT AND LAY TILE . . . kit has cutting tip *and* utility burner for heating underside before laying tile . . . cutting tip also helps you: carve wood, tool leather, cut linoleum, etc.

BURN PAINT . . . flame spreader in your Bernz-O-Matic kit gives broad, clean flame . . . for burning paint, antiquing furniture, heating tile.

BERNZ O MATIC® TX-888

All-purpose TORCH KIT . . .

Instant-lighting Bernz-O-Matic Torch with all these accessories:

Pencil Burner Unit, Utility Burner Unit, Flame Spreader, Soldering Tip, Cutting Tip

Regular value $13.15 ONLY **$8.88** At your favorite hardware store.

Uses the amazing Bernz-O-Matic disposable propane cylinder—*miracle of modern convenience* that makes possible:

BERNZ-O-MATIC LANTERN—No pumping or priming. Lightweight, easy to use. $12.95

BERNZ-O-MATIC STOVE—One or two burners. Lights instantly, cooks a meal in minutes, won't blacken pans.
1-BURNER STOVE $11.95—2-BURNER STOVE $19.95

At your hardware or sporting goods store.

OTTO BERNZ CO., INC.
Driving Park and Ramona St. • Rochester 13, N. Y.

How To Test For *PROPER TENSION*

. . . the "Anti-Bind" Secret of

SANDVIK

Swedish

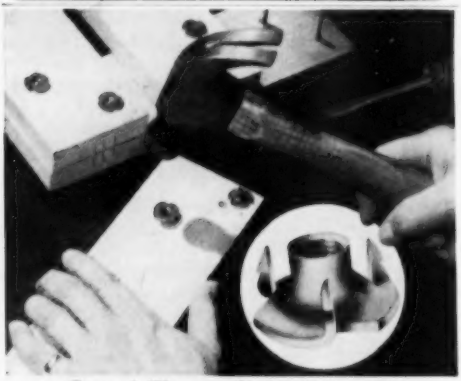
HAND SAWS

Bend saw and hold a straight edge across blade as shown. If tension is correct, the gap which appears between the straight edge and the blade will make a uniform arc from the center to both edges. An uneven arc indicates poor tension which causes binding.

In SANDVIK saws special care is given to proper static tension. This assures superior balance and flexibility . . . two of the factors which have made SANDVIK world famous for smooth, fast-sawing ease. Ask to see a SANDVIK.

SEND FOR THIS FREE 16 PAGE BOOKLET
On How To Choose and Use Hand Saws

SANDVIK STEEL, INC.
Saw & Tool Division
1706 Nevins Road, Fair Lawn, N. J.
In Canada: P. O. Drawer 1330, Station "O", Montreal 9, P. Q.



Steel Threads in Wood!
It's Easy with DOT TEENUTS®!

Wherever you need real rugged bolt-holding strength, TEENUTS provide flush mounting without countersinking, like putting steel threads right into the wood! Literally hundreds of uses! Available in 7 popular sizes! Only 15¢ per card! At hardware counters most everywhere! Get yours now!

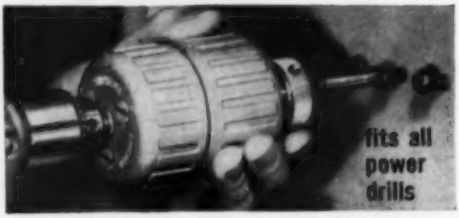
look for the DOT on the package

COLUMBIA FASTENER CO.
3229 S. Ashland Ave., Chicago 8, Ill.
Subsidiary UNITED-CARR FASTENER Corporation

SUPREME

Versamatic

REVERSIBLE SCREW DRIVER AND SPEED REDUCER



First time ever! It REVERSES!

Drive *and remove* screws with Supreme Versamatic. Versamatic reduces speed 7 to 1, increases power 7-fold. *Reverses* with one twist. Handles even the largest screws with ease. Also for nut running (adapter furnished); tapping; and all heavy duty drilling where speed reduction is needed. Fingertip control means safe, fast work. Complete set $14.95. (½" chuck extra). At hardware stores or direct from

SUPREME PRODUCTS Corp., 2222 S. Calumet, Chicago 16

AUTOMATIC RETOOTHER

MAKES NEW PROFITS

for HAND SAWS

Cuts new teeth in 50 seconds—any size 4 to 16 points. Old teeth fall off as chips. Easy to operate. A perfect job.

FREE! Write Now for Descriptive Literature

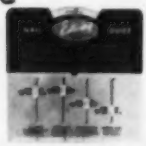
BURR MFG. CO.
8943-A VENICE BLVD. LOS ANGELES 34, CALIFORNIA

When Writing to Advertisers Please Mention Popular Science

Handy Nail Guide

HELPS YOU
SAVE TIME AND MONEY

- Tells right nail for each job
- Tells amount of nails per pound
- Tells right hammer to use



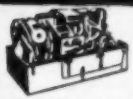
YOURS FOR JUST 10¢ Send coin direct to Estwing

Estwing **UNBREAKABLE TOOLS**

CHOICE OF CRAFTSMEN FOR 30 YEARS

ESTWING MFG. CO., DEPT. PS-1, ROCKFORD, ILLINOIS

WAR SURPLUS AND OTHER BARGAINS SAVE UP TO 90%



AUXILIARY POWER AND DC LIGHTING & WELDING PLANT
Model C-2, Navy type 1. Engine comes complete with spark plugs, generator self starter, voltage regulator, reverse current relay, silencer case, dual scintilla magnetos, Stromberg carburetor. Use as portable welder. Develops 300 amps & more. Capacity up to 7½ KW. Engine 14.5 HP. Up to 7500 Watts. Terrific as standby power supply, in boats, to power small cars, as a complete lighting system. Operates all DC equipment. Like NEW, all engines checked & run before shipment. Wt. cased 360 lbs., wt. net 130 lbs. Mfd. by Lawrence. Approx. GOVT. COST $4590. **Now only $187.75.**

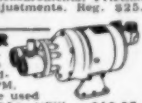
FAMOUS B-16 KOLLSMAN AIRCRAFT COMPASS
Finest compass ever made. For use on planes, boats, cars, trucks. In current use on small & large aircraft. Can be hand carried on expeditions, weighs 1½ lbs. Graduated in 5° increments. Liquid filled, lighted, poly-plane compensator. Panel mounting. 3⅛" dia. face, 4½" in depth. Like NEW. Approx. GOVT. COST $150. Only **$13.95** ppd.

ASTRO COMPASS MARK II A standard instrument used by U. S. Air Force & Navy & commercial airline navigators for obtaining true heading, checking & adjusting magnetic compasses, taking bearings of celestial & terrestrial objects & identifying stars. Makes a satisfactory pelorus & azimuth circle for either air or marine navigators. Perfect for amateur astronomers. Complete with carrying case. Approx. GOVT. COST $400. NEW **$12.95** ppd.

OLDAK DIAL INDICATOR Finest quality. Made to AGD standards except in range. Continuous or balanced graduations as required. All parts interchangeable. Made in England. Spares available. Totally enclosed case. Detachable contact point with hard steel ball. Model AL814. Graduated in 1/1000 in. Tell tale hand records the number of revolutions of large hand. NEW. Terrific value. **$11.95** ppd.

NEW IMPROVED MAUSER-TYPE VERNIER CALIPERS
Quick, handy, accurate. 6" Vernier Calipers. Glass hardened, lapped measuring surfaces. Fine engraved scales—1/1000" and 1/128" for inside, outside & depth measurements. Friction thumb release. Larger capacity. 2 gib adjustments. Reg. $25. Now only **$7.95.** Leather case, **$1** extra.

BENDIX PUMP & MOTOR
Can be used for pumping fuel, oil or wherever hydraulic pressure is required. Pump has 1" connections, built-in relief valve, adjustable up to 1500 lbs. Max. capacity 6 GPM. 1½ H.P., 24 volt motor, 4000 RPM. Can be used on 12 to 36 volts. Approx. GOVT. COST $350. NEW — **$10.95.**



MICROMETERS Black crackle finish frame. Easy-to-read graduations in .001. NEW. 0-1" cap. **$2.69** ppd. 1-2" cap. **$3.79** ppd.

ARC WELDER KIT $27.95 — build your own Complete make-up package consisting of 1 Aircraft DC Generator, Electric Auto-Lite 160-240 Amps. 24 Volt. RPM from 2600 up. 1 Rheostat, 1 Giant Toggle Switch, 1 Ammeter, 1 Shunt, 0 to 240 Amps. 1 Voltmeter, 0 to 30 Volts. 1 Electrode Holder. 1 Welder's Shield. 1 Voltage Regulator. Wiring diagram for hookup as welder. Wt. under 100 lbs. Approx. GOVT. COST $475. Like new, perfect . . . **$27.95.**

DC Generator (only) — same as above . . . if purchased separately: $13.50.

R1 GENERATOR KIT Jack & Heints or GE. Rated 300 Amps. 24-32 Volts. With same items as above incl. 300 Amp Ammeter. Approx. GOVT. COST for kit $600. Complete kit only **$39.95.** Wt. 60 lbs.

HEAVY-DUTY RHEOSTAT Designed for heavy-duty use with Air Force heated suits. Ideal for regulating voltage on electric welders, model trains, lights, generators; controls soldering irons, etc. Rated 5.75 ohms, 100 watts with double windings and dual female 25 amp. 125 volt receptacles. Size: 7" H x 5¼" W x 1¾" D. Shpg. Wt. 2½ lbs. Approx. GOVT. COST $25. Brand new, only **$1.95.**

LONG FLUTE, HIGH SPEED DRILLS
20 assorted, numbers & fractions. Like NEW. Approx. GOVT. COST $30. Only **$3.00** ppd.

HIGH SPEED HAND TAPS 10 assorted, precision-ground thread. National mfr. Like NEW. Up to ½". Approx. GOVT. COST $25. Now **$2.50** ppd.

PRECISION GROUND SQUARES
Production engineer's squares. Accuracy guaranteed. Mfd. by Wright & Moore, Sheffield, England. Square blades, hardened & tempered. BRAND NEW. Fraction of original cost. 2"—**$2.75**, 3"—**$3**, 4"—**$3.25**, 6"—**$3.75**, 9"—**$7**, 12"—**$9.95.**

140-1 REDUCTION GEAR Make your own winches, hoists, wagon unloaders, stump pullers or fence stretcher. Sturdy aircraft quality. Built-in (removable) 24 Volt DC motor & clutch. High torque. Low speed. 100's of uses. Wt. 42 lbs. Approx. GOVT. COST $300. Like NEW. Only **$12.** *225-1 Reduction Gear, same as above — **$13.90.**

REVERSIBLE RACHET WRENCH
For diesels, ships, farm machinery, trucks, bridges, oil fields, all heavy equipment. Terrific leverage. 4' Lowell, safety steel, sockets for 2 3/8", 2 9/16" & 3 1/8" hexagon nuts. Navy surplus. Approx. GOVT. COST $215 a set. Wt. 50 lbs. NEW! Now **$10.95** per set.

NEW! BIG CATALOG Send 25c for your copy. Postpaid prices in U.S.A. only. Other prices F.O.B., Culver City, Calif. Send check, cash or money order. 50% deposit required for C.O.D. orders.

AIRBORNE SALES CO., INC. DEPT. PS457
8501 Stellar Drive, Culver City, Calif.

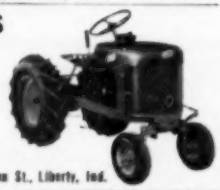
FREE WHOLESALE CATALOG get up to 50% off

MAKE MONEY! SAVE MONEY!
Buy Tools, Hardware, appliances, photo equipment, sporting goods, power tools, paints and thousands of other nationally advertised products at WHOLESALE COST TO YOU.
"SEND FOR FREE 1957 WHOLESALE CATALOG TODAY"
SILVO HARDWARE COMPANY
Dept. PS 4, Box 266, Phila. 5, Pa.

NEW LIFE for old brushes

IMPERIAL Rapid Brush Cleaner
cleans hard-caked brushes in a jiffy. Acts instantly—no long soaking. Leaves bristles like new—never flabby.
At paint and hardware stores.
Wilson-Imperial Co., 121 Chestnut St., Newark 5, N. J.

Garden-All Tractors
a size and price for all
2 and 4 wheel models with over 50 quick, easy attachments.
plow—disc—harrow—sow
mow—rake—dump—scoop snow
2 to 9 HP
Priced $129.50 to $695
Quality unequalled!
Free literature—write:
Garden-All Tractor, Inc., 194 W. Union St., Liberty, Ind.



"GETTING THE MOST OUT OF YOUR RADIAL SAW"
NEW DELTA hard bound book covers all phases of Radial Saw operations with over 300 photographic illustrations and line drawings—only $1.00. Send for FREE folder on complete Delta Library. Delta Power Tool Division, Rockwell Mfg. Co., 504D N. Lexington Ave., Pittsburgh 8, Pa.

WELD IT YOURSELF IN A JIFFY!
Weld, Cut, Braze, Solder; Iron, Steel, Brass, Bronze, Aluminum and other metals safely and easily. Make your wrought iron furniture, porch railings, fences, knick-knacks and other metal specialties. With this fine equipment anyone can do professional-like work with little practice. The Dynamic is an industrial type transformer arc welder designed to operate from any properly wired 110 volt AC line.

EASY PAY PLAN
Low down-payment. Pay as you weld. Money back guarantee. Complete outfit including special FALL GIFT.
Only $38.50
F.O.B. Factory

Order your Dynamic Industrial type transformer Arc Welder for Workshop or Industrial use today. Order from this ad.
Literature on larger equipment available on request.
DYNAMIC WELDER COMPANY, 1808 S. Federal Street, Dept. D3-D, Chicago 16, Illinois

CRAFTSMEN, HOBBYISTS, INVENTORS

THE MOST IMPORTANT TOOL YOU CAN OWN IS THE WORLD FAMOUS

UNIMAT 10 IN 1 COMPLETE WORKSHOP

CHECK THESE FEATURES:

- **UNIMAT** is a precision electric tool that will enable you to machine an endless variety of small parts from steel, brass, wood, aluminum, plastics, etc.
- **UNIMAT** is portable and compact . . . takes up no more room than a typewriter.
- **UNIMAT** is simple to operate and converts quickly into 10 different tools . . . all operations are off one base.
- **UNIMAT** basic unit now at new low price of $99.50. Available on budget plan at no extra cost.
- **UNIMAT** can be tried at home for 10 days with a money back guarantee if you're not completely satisfied.

MAIL COUPON FOR FREE CATALOG

Find out exactly what this amazing machine can do for you

AMERICAN EDELSTAAL—UNIMAT DIVISION
Dept. 147 350 Broadway New York 13, New York
NAME .....
ADDRESS .....
CITY ..... STATE .....

IT'S FUN TO RIDE

MOW Cycle BY MUSGRAVE

the original riding mower

MOW CYCLE '24'

Send for free folder

More advanced features for the quickest, slickest mowing job of all! 3½ hp engine, twin rotary blades — safe, simple, economical to operate. Own *MOW CYCLE* this spring!

MOW CYCLE '24' $289.50
MOW CYCLE 'CADET' $219.50

Prices F.O.B. factory.
Dealer adds freight and local taxes. Slightly higher in far west.

MUSGRAVE, INC., SPRINGFIELD, OHIO

NOW—THE QUICK-WAY TO SHARPEN ALL CIRCULAR SAWS

NEW

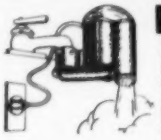
Model PG-12 Complete No extras to buy. $16.50 Postage Paid

Model PG-12 sharpens, joints, gums, and retooths all cross cut, rip, combination, miter, and planer blades up to 12" in diameter. Two precision index plates give versatile, accurate sharpening. Guarantees precise spacing of teeth. New safety rest prevents tilting and gouging of blade. Save time and money. Special $3.00 grinding wheel also included for use on your own power table. Fits regular or radial swing tables.

Order today. Send check, cash, or money order. We pay postage.

FREE Booklet—How to Sharpen Circular Saws.

QUICK-WAY SAW CO., 134 Tompkins St., Cortland, N.Y.



FAUCET WATER HEATER

Instant hot water for just pennies—You just slip MASTER MECHANIC'S new Faucet Water Heater over any faucet—plug it in a wall outlet and you've got steaming hot water instantly for dishes, shaving, washing baby's bottle, etc. Simple and safe—operates on ordinary 110 v. house current—costs only 2½ cents per hour for hot water. Ideal for homes, shops, cabins, trailers, etc. Easily regulated from lukewarm to full hot. *Fully guaranteed.* (Item 408) Wt. 2 lbs. Factory price **$4.95**

Send 10¢ for 100 page Catalog-FREE with order. Prices f.o.b. factory—Send check or M.O.

MASTER MECHANIC MFG. CO., Dept. 35-Q, Burlington, Wis.

---

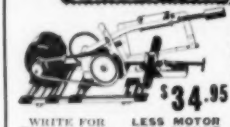
don't say glue . . . say "Yoo-Hoo"

UHU®

GLUES EVERYTHING BETTER!

At variety, hardware, magazine & newspaper stores

Iron Mike – 3½-inch Portable Power Hack-Saw



CUTS THINNER THAN A DIME! IRON MIKE is Portable . . . carry it to the job. Uses ordinary 10" blades, cuts any metal up to 3½" thick, or pipe up to 4¾" OD. Rugged steel construction. Order direct, or at your dealer . . . satisfaction guaranteed.

$34.95 LESS MOTOR AND MOUNT

WRITE FOR FREE FOLDER

ARCO MFG. CO.
Dept. PS, Grand Forks, N. Dak.

When Writing to Advertisers Please Mention Popular Science

Holt's HAVE THE ANSWER!

HOLT'S ORIGINAL TRADE MARK **Piston Seal**

20 years on the market. No one else can make such a claim. Next best thing to complete motor overhaul . . . at *1/20* the cost. Good for 10,000 miles.

1 – reduces oil consumption
2 – restores compression
3 – stops piston slap
4 – increases miles per gallon
5 – improves performance
6 – makes engine quieter

Only $4.95 a Tube

Holt's FIREGUM® for all Exhaust Fitting and Assembly

GUARANTEED 100% MONOXIDE-FREE JOINTS IN ALL EXHAUST SYSTEM ASSEMBLY

New— TESTED—Withstands White Heat

Smooth, white paste. Sets hard with heat. Lubricates joints. No leaks or rattles. Holds like a clam.

Makes Assembly Quick and Easy

$1.70 Large Tube

Ask for Piston Seal and FIREGUM at nearest garage or auto store.

Write for full details

TREGLOWN CO., Inc.
Fanwood 122, N. J. *Trade Mark Regd.

PAINTING IS EASY!

with the famous **BURGESS** *electric* **SPRAYER**

Just plug in and Spray:

- paint • varnish • enamel
- shellac • mothproofers
- garden sprays • water
- insecticides

PAINT 3 to 7 TIMES FASTER!

For the fastest, smoothest painting or spraying job you ever saw, try the Burgess Sprayer. Completely self-contained . . . just plug into regular household outlet, pull the trigger, and paint furniture, floors, walls, screens, cabinets, fences. Fine for mothproofing and garden spraying, too. Sapphire nozzle, handy spray adjuster, new convenient hanging hook, 25 oz. graduated jar. Easier to clean than a brush.

only **$12.95** AT YOUR FAVORITE DEALER

If not available locally send $12.95 for postpaid delivery. Money-back guarantee.

SEND FOR FREE BOOKLET "HOW TO PAINT THE EASY WAY"

BURGESS VIBROCRAFTERS, INC.
DEPT. A-66 • GRAYSLAKE, ILLINOIS

The Modern PLASTIC for lasting Home Repairs

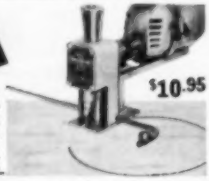
PERMANENTLY mends cracks or holes in wood, tile, stone or plaster. Sticks and stays put—Does not chip, shrink or fall out. Easy to use. Economical. Mold it, chisel it, polish or paint it. The big 4-lb. can is obtainable from your lumber, paint or hardware dealer at $1.25; or will be shipped direct postpaid (in U. S.) for $1.50. Complete satisfaction guaranteed or your money refunded. Order now.

DONALD DURHAM CO.
Box 804-U Des Moines, Iowa

CUT EXACT CIRCLES CURVED PATTERNS

"ARCO JIG-SAW"

with **Circle-Cutter** (up to 20" dia.) & **Rip Gage** fits any ¼" drill. Has speed of 855 saws. Cuts 2x4's, plywood, metals, etc. Incl. blade. **At your dealer** or try it on our **10-day trial.** Send check, M.O. (ppd.) C.O.D. + post. **ARROW METAL PRODUCTS CO., Dept. PS-4, 140 West Broadway, N.Y. 13, N.Y.**



$10.95

Professional Mechanics'

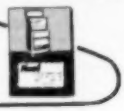
TOOL CHEST

FOR YOUR HOME WORKSHOP

This may be the lowest cost *full-sized* chest in America! 4 sliding drawers in blue-gray rugged steel cabinet. 26" x 12½" x 12½". Keep your valuable tools safe, clean and always at your fingertips.

$25.90 F.O.B. ST. PAUL

FREE BULLETIN describes this and 12 other models!



HUOT MFG. CO.
532 No. Wheeler St., St. Paul 4, Minn.

REDI-BOLT®
THREADED STEEL RODS

Save repair and construction time. Just cut to length; heat and bend; add std. nuts. Seven sizes: ¼", 5/16", ⅜", 7/16", ½", ⅝", and ¾". Handy lengths of 24" and 36". Available in galvanized or blue rust-resistant finish.

Sold in Leading Hardware Stores

REDI-BOLT, Inc.
5344 Indianapolis Blvd., East Chicago, Indiana

LICK SUMMER DROUGHTS
Drill your own well

SAVE MONEY . . . have water when you need it, with the sturdy, compact NATIONAL WELL DRILLER. Drills wells deep or shallow, anywhere — built for years of service. Lightweight, easy to operate; one man can set up, runs on an electric or gasoline power. Used by U.S. Depts. of Agriculture and Forestry, U.S. Navy.

START YOUR OWN BUSINESS . . . by renting and contracting National Well Drillers.

MODEL 400 — for 4" casings, includes driller, boiler and 100' cable. Price $425.00 F.O.B. factory, weight 500 lbs. Additional cable, ¾ hp. electric motor or 1½ hp. gasoline engine available at extra cost.

HEAVY DUTY MODEL 600 — for 6" and 8" casings, available with gasoline engine. Mounted on trailer with collapsible frame for easy transportation. **Guaranteed for 90 days.**

Write for free literature on complete line — Dept. PS-47

national well driller
THE NATIONAL WELDING AND MANUFACTURING CO.
NEWINGTON, CONNECTICUT

The Secret of Scratch-free Sanding!

Ask any expert—the secret of a perfect finish is to *sand with the wood grain!* The old-time craftsman did when he sanded by hand. And so do you, when you use a Dremel Straight-Line Action Sander—except that a powerful motor does all the work.

With Dremel Straight-Line Action, you leave no cross-grain scratches or orbital swirl marks to mar the finish of your project. Three models to choose from.

Get a Dremel from your local power tool dealer. If he can't supply you, order direct from factory on 5-DAY TRIAL, money back guarantee. We ship postpaid.

Dremel Straight-Line Action Power Sanders

3 popular models—$14.85 to $34.85

FREE Power Tool catalog. Write today!

DREMEL MFG. CO.

Dept. 127D Racine, Wis.

NOW...WASH OFF OLD PAINT WITH WATER!

brush it on . . . wash it off

SHERWIN-WILLIAMS WASH-AWAY PAINT REMOVER

You'll be amazed how easy it is to use this miracle new WASH-AWAY Paint Remover. Just brush it on . . . wash it off, and the surface is ready to refinish. Removes layer after layer of old paint from wood, metal, glass or plaster surfaces. No scraping! Nonflammable! Guaranteed to perform as described or money refunded.

GET IT FROM YOUR **SHERWIN-WILLIAMS** PAINT DEALER

HOLD-E-ZEE®

the Original AUTOMATIC GRIP **SCREWDRIVERS**

FINEST MATERIALS AND WORKMANSHIP

LOK-BLOK® makes blade twist and impact proof.

GRIPPER recedes deep into handle, giving full blade use.

SPECIAL BIT fits both types cross-point screws.

—YET COST NO MORE THAN ORDINARY SCREWDRIVERS!

At Leading Dealers Everywhere

UPSON BROS., INC., ROCHESTER 14, N. Y.

Metal Turning Lathe for Model Makers

SEND FOR FREE FOLDER describing the new Lathe for Model Makers. 15¼" bed with 4½" swing; 7" between centers. Guaranteed.

Only . . . . . f.o.b. Lansing. **$35.00**

Rosemoor Manufacturing Co., 2701 Bernice Rd., Lansing, Ill.

3 CU. FT. MIXER DIRECT FROM MFR. 39.75

Fills long felt need for small mixer for concrete, feed, fertilizer, seed and many other materials. Saves ¾ cost of ready mixed concrete. Pays for itself on first job. Combination belt pulley and crank for hand operation. Also power mixers. Write for circular.

3 Cu. Ft. Drum—Mixes 2 Cu. Ft. Concrete $39.75
5 Cu. Ft. Drum—Mixes 3 Cu. Ft. Concrete 59.50

FOB Pulaski, N. Y. Cash, Check or M. O. Money back guarantee

UNITED STATES FORGE AND FOUNDRY CO.
CONSTRUCTION EQUIPMENT DIV. PULASKI NEW YORK

Wholesale! TOOLS! GUNS! CAMERAS!

BUY TOOLS, PHOTO EQUIPMENT, SPORTING GOODS, JEWELRY AND THOUSANDS OTHER NATIONALLY ADVERTISED PRODUCTS AT BIG DISCOUNTS. SAVE ON OWN PURCHASES. BIG PROFITS SELLING TO OTHERS. POSTCARD BRINGS FREE COPY "THE WHOLESALE PLAN"

Get up to 40% off

AMERICAN BUYERS SERVICE

HERTEL STATION, DEPT. 8, BUFFALO 16, NEW YORK

DIGS 2" TRENCHES to 18" DEEP

New Model BA DITCH WITCH digs 2-in. trenches to 18-in. deep. Perfect for lawn sprinkler systems, utility service lines. Deposits all spoils on one side of trench. Larger models available for depth to 5 ft.

Low Cost! Write for new Bulletin.

THE CHARLES MACHINE WORKS
637 B Street Perry, Oklahoma

BOAT KITS 28 MODELS-8 to 19 ft. $39 up-FREE FREIGHT

SAVE 2/3!
Easy-to-build
MAHOGANY
DECKS & FRAMES
SEND 10¢ for CATALOG
Includes Hardware-Trailers-Fiberglas

Boat Plans-Patterns-Frame Kits

Build over 50 modern boats from large scale plans, available with FULL-SIZE patterns, new PRE-FAB frame kits! All types: prams to cruisers, 6 to 25 ft. Best buy for Ameteurs! SEND 10¢ for CATALOG.

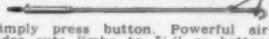
Craig Craft
Tonawanda, N. Y.

GIGANTIC SAVE-TO-70% **MAIL SALE** WAR SURPLUS EXCESS INVENTORY BANKRUPT STOCK

GOLF CAR BATTERY MOTOR

• Precision built, powerful ball bearing unit. Operates on 6, 12, or 24-v DC. Reversible 100-300 rpm output. For golf car, midget auto, motorized wheel chair, automatic feeders, etc. Wt. 31 lbs. Cost $245 . . SALE **$19.46** FOB

AIR POWERED TREE TRIMMER



• Simply press button. Powerful air cylinder cuts limbs to 7/8" or better. Operates from any small home air compressor. Works on 40-70 lbs. air. 10' Reg. list, $69.50. SALE, **$8.89** F.O.B.

BROADSWATH TRACTOR SPRAYER

• Complete outfit as shown. Easy to mount & use. Sprays swath 41" wide. Famous nylon roller tractor pump. Will pump up to 200 psi & 6 g.p.m. Excellent for pasture, small grain, etc. SALE ..... **$79.95** Ppd.

IRRIGATION PUMPS

2½" Size, 16,500 gph

• Brand new, bronze, ball bearing pump. Wonderful farm, contractor, industry pump.

• Capacity to 280 g.p.m. Pressure to 65'. Speed 2100-2700. Clockwise rotation. Complete with 6" pulley. Wt. 40 lbs. Size 10"x11"x9". Inlet 2½", outlet 2". Nat'l Adv. List $98.00. SALE..... **$39.95** FOB

2" hose, 2½" plastic pipe available (Write)

CONTRACTOR-FARMER LEVELS

• Leading make precision instruments. Excellent achromatic optics. Ideal for farmers, contractors, architects, etc. for leveling, contouring, bldg. construction, etc.

• **No. 1, Level**—Complete with 2-sec., 9' rod, tripod, case, instr. SALE..... **$47.00** Ppd.

• **No. 2, Level**—Rack & pinion focus. Complete with 3-sec., 8½' rod, tripod, case, instructions. SALE..... **$84.75** Ppd.

• **No. 3, Level-Transit.** Combination unit suitable for leveling or lining up. Rack & pinion focus. Complete: 3-sec., 8½' rod, tripod, case, instr. SALE..... **$84.50** Ppd.

HYDRAULIC BARGAINS

• Special purchase! Brand new hydraulic cylinder, 3½" bore, 24" stroke, single acting. 9621 lbs. push. Rod diam. 1¾". List price $49.95. SALE..... **$27.95** FOB

• **2-way Cyl. 3" bore, 6" stroke...Ppd. $14.95**

• **Hyd. Valve for 1 & 2-way cyl. Ppd. $12.95**

• **Hyd. Pump, 1000 psi 12 g.p.m. Ppd. $45.50**

• **Hyd. Gauge, 1000, 1500, 3000 psi (Specify)** ..... Ppd. $3.49

Other Hydraulic Bargains

GEAR REDUCTION MOTOR

• Multiple gear, ball bearing motor with enclosed 42-to-1 reduction gear box. High torque. 10 to 200 rpm output, reversible. Runs on 6 or 12 v DC or 110 AC through series resistors. Many uses. Cost $35. SALE..... **$4.97** Ppd.

SPECIAL OF THE MONTH!

SPORTSMAN'S HAMMOCK

• Brand new, gov't surplus. Ideal for all outdoor use. Insect and bug proof. Genuine nylon mesh screen. Waterproof canopy gives rain and sun protection.

• Full length zipper for easy entry and exit. Complete with ropes and hanging rings. Cost Gov't $21.00. SALE..... **$7.95** Ppd.

AIR COMPRESSORS, TANKS, ETC.

• **Stainless Steel tank, 12" x 24".** Capacity 2100 cu. in., 400 psi. ¼" pipethread ports. Brand new. Cost Gov't over $40.00. SALE ..... **$16.95** FOB

• **Compressor,** 1-Cyl., 2.80 cfm. Ppd. **$19.95**

• **Compressor,** 2-Cyl., 10.4 cfm. Ppd. **$49.95**

• **Press. Gauge,** 100, 160, 300 psi (Specify) ..... Ppd. **$1.89**

• **Regulator,** Hi-Pressure..... Ppd. **$3.29**

Complete Stock Air Items

ARMY POWER PLANTS

• Amazing buys surplus Army and factory-to-you plants and generators. Save to 60%.

• 1000-w, 115-v, 60-c **$179.50** Ppd

• 2000-w, 115-v, 60-c **269.95** Ppd

• 3000-w, 115-v, 60-c **299.50** FOB

• 5000-w, 115-v, 60-c **497.50** FOB

Many other plants, generators. Get catalog.

ORDER FROM AD or write for big new **FREE CATALOG** 1000s items at tremendous savings. We pay frt. except where FOB.

MONEY BACK GUARANTEE

BURDEN SALES COMPANY

826 "O" St., LINCOLN, NEBRASKA

HUNTERS CONFISCATED MODEL "MN" RUSSIAN RIFLES

IDEAL FOR BIG GAME

FREE AMMO

$14.95

The Russians won the International meet Venezuela (1954) with this Model MN "(Moisin-Nagant). 6-shot, bolt action, 7.62 MM. Mechanically perfect. Bore, fair. Excellent hunting cartridge. Hinged floor plate. These guns confiscated from Communist revolutionaries. Type used by Red Chinese in Korea. Their sale in no way aids any iron curtain country. POWERFUL: 2820 F.P.S. w/ 150 gr. amm. Hardhitting weapon for all big game. **FREE AMMO:** 20 rds. with each gun. ADDIT. AMMO.: Military, 100 rds., $7.50. Softnose Sporting Load, 20 rds. $2.95 **TO ORDER MODEL MN:** Send check, cash, m.o. $5 dep. for C.O.D. Calif. resid. add 4% state tax. DEALERS INQUIRE.

GOLDEN STATE ARMS CORP. 204 Armory Bldg., 386 West Green Street, Pasadena 7, Calif.

MAGNETS

PERMANENT ALNICO

10 Assorted Magnets $1.00

Bulletin Board Magnets	10 for $1.00
Hot Pad Magnets	12 for $1.00, 50 for $3.50
Pencil Type Magnets	2 for 90¢, 6 for $2.50
Retrieving Magnets, 25 lb. pull	$3.85

Send M.O. or check. We pay postage. No C.O.D.

HOLLYWOOD HOUSE OF MAGNETS

6912 HOLLYWOOD BLVD., HOLLYWOOD 28, CALIF.

MILWAUKEE Garden Tractors

For TILLING, PLOWING, MOWING

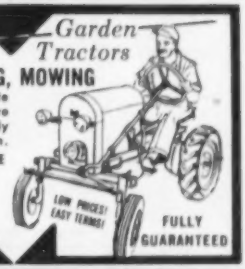
Safe and easy to operate — complete gear drive with reverse. So handy around the home or farm.

ORDER DIRECT OR WRITE FOR CATALOG. S

MILWAUKEE GARDEN TRACTOR CENTER

2376 South 108th Street

Milwaukee, Wisconsin



Trindl "ARC TESTER" ARC WELDING

FREE

WRITE FOR COMPLETE DETAILS AND EASY PAY PLAN

NOW! HOME CRAFTSMEN CAN OWN THIS PROFESSIONAL ARC WELDER

EASY TERMS ONLY $98.50 F.O.B.

Now you can own a Trindl full 125 amp Industrial Welder at a price far less than smaller machines. With a Trindl 125A you can weld metals up to ½ inch thick. Operates off either 110 or 220 volt line, properly wired. 16 heat stages from 20 to 125 amps. Make and repair anything of metal around the home, garage, farm or shop, like a professional. No previous experience or training needed. Full "do-it-yourself" instructions with each machine. Complete only $98.50 f.o.b. factory, or write for details. Trindl manufactures a complete line of heavy duty welding machines. Dealer inquiries invited.

TRINDL PRODUCTS Ltd., Dept. T3-D

1807 So. Clark St., Chicago 16, Ill.

Trindl "ARC TESTER" ARC WELDING

Guaranteed

12 MONTHS IN CONTINUOUS OPERATION

America's first and finest Reciprocal-Action Saw

NEW *WHIZ-SAW* MODEL NO. 10

OUT-PERFORMS HIGHER PRICED SAWS

Extremely high powered and low, low priced. Forsberg's newest Whiz-Saw—Model No. 10—rips and cross-cuts two inch finished lumber with ease and speed—3250 blade strokes per minute. Makes inside cuts without boring a starting hole . . . handles easily . . . safe to operate . . . guaranteed for long service. Made by the Mfr. of the "original Whiz-Saw." Now available at leading hardware stores. Choice of 4 models.

THE FORSBERG MFG. CO., BRIDGEPORT 1, CONN.

NEW! amazing metal mender

1001 USES

Magic®

PLASTIC ALUMINUM

REAL METAL in PASTE form!

Repairs all Metal • Easy to Use • No Heat or Tools Needed • Dries Metal-Hard in 3 Hours • Waterproof, Gasolineproof & Heatproof up to 600° • Can be Drilled, Filed, Tapped Threaded when Dry • Solders, Seals, Repairs • Saves Time and Money • For Home, Industry, Autos, Boats, Plumbing

Magic Plastic Aluminum is the most amazing repair product since the invention of the nail! It is real metal in paste form and has most of the properties of metal. Easy to use by anyone—no tools or heat needed.

At all Hardware, Paint, Department and Auto Supply Stores, $1.00 — *or send $1.00 direct to:*

MAGIC IRON CEMENT CO. 5400 Bower Avenue Cleveland 27, Ohio

HOME REPAIR TIP No. 28

WRAP SPLINTERED HANDLES of tools or implements with tough, waterproof "SCOTCH" 33 Plastic Tape. Thin, stretchy plastic tape sticks tightly and makes a smooth, sliver-free grip. Good for electrical repairs, mending rainwear, too. 39¢, 75¢ sizes at stores everywhere. © 1957, Minnesota Mining & Mfg. Co., St. Paul 6, Minn.

115-Volt, A.C.

ELECTRIC GENERATOR

1750 Watts, 60 Cycle

A.C., Single Phase

Government Cost $185.00

Brand New SURPLUS! *Fully Guaranteed*
Ideal as a permanent or stand-by unit for electricity IDENTICAL to your house current. Perfect for farms, camps, aboard ship, oil fields, mines, etc. Easily handles lights, refrigerator, deep freeze, oil burner, radio; power for saws, floodlights, drills, pumps, etc. ALL BALL BEARING! Operates at 3600 RPM. Drive with 3½ HP or larger engine—or use power take off. Voltage self regulating. Standard base mtg. Two outlets. Size: 15" lg., 8" dia. Wgt. 58 lbs. Delivers 1750 watts CONTINUOUSLY! Operates in either direction!

Only $99.50 fob

SUPPLY LIMITED! ORDER DIRECT FROM AD

Free Catalog of other Surplus, Hydraulics

ROBERTS ELECTRIC CO., Dept. PS-602, 849 W. Grand, Chicago 22, Ill.

GEARS

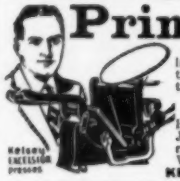
In Stock—Immediate Delivery

Gears, speed reducers, sprockets, thrust bearings, flexible couplings, pulleys, etc. A complete line is carried in our Chicago stock. Can also quote on special gears of any kind. Send us your blueprints and inquiries.

Send for Complete Catalog No. 220

CHICAGO GEAR WORKS

440-450 N. Oakley Blvd. Chicago 12, Ill.



Print Your Own

Cards, Stationery, Advertising, Circulars, labels, photo and movie titles, church work, tags, etc. Save money. Sold direct from factory only. Raised printing like engraving, too.

Own a Printing Business

Print for Others. Good Profit. Have home shop. Junior press $15; Senior $29 up. We supply everything. Easy rules. Pays for self in short time. Write for free catalog of outfits and all details.

KELSEY PRESSES, C-33 Meriden, Conn.

Be GOOD to your WOOD

Deft-finish it

A finer semi-gloss interior wood finish that SEALS, PRIMES, FINISHES. Dries in 30 min. Beautiful BAR TOP finish—so easy to apply.

deft

WOOD FINISH

DESMONDS, 1826 W. 54, LOS ANGELES 62, CALIF.

132 PAGES
Many in full color
packed with rare, fancy & imported woods ... veneers, plywoods, patterns, tools, ornaments, hardware ...everything for the woodworker.

Get This NEW Catalog of WOOD & WOODWORKING EQUIPMENT

WORLD'S LARGEST SELECTION OF FINEST DOMESTIC AND IMPORTED WOODS . . . MOULDINGS, HARDWARE, TOOLS,—ALL AT LOW MONEY SAVING PRICES!

Your complete wood buying guide and project book. Craftsman is your best, most complete source of finest kiln-dried domestic and rare imported woods, beautiful wood inlays, colorful bandings, matched plywoods, embossed mouldings, carved ornaments, newest woodworking tools, "hard to find" cabinet hardware and fittings... more than 1,500 items! Packed with newest scroll saw patterns, project ideas & money making plans. Enclose 25c (refunded with first order) to help pay mailing, handling cost. Write now!

Craftsman Wood Service Co., Dept. B-4
2729 S. Mary Street - Chicago 8, Ill.

Works in seconds!

Loosens Rusted Bolts
nuts . . . screws . . . parts

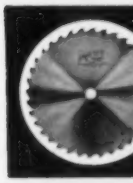
LIQUID WRENCH

The super-penetrating rust solvent that quickly loosens rust and corrosion.

AT HARDWARE STORES, GARAGES, FILLING STATIONS EVERYWHERE

For information write manufacturer

RADIATOR SPECIALTY CO.
Charlotte, N. C.



SAVE 60%
ON SAW BLADE COST

WITH HEINEMANN'S **HARD-TIP** SAWS

Deep hardened for easy resharpening. So economical, can stays sharp so long. It's practical to replace blade when dull. Its easy resharpening just like your regular blades. Or request brochure from

HEINEMANN SAW CORP.
CANTON, OHIO

DRAINS cellars, cisterns, wash tubs; **IRRIGATES - CIRCULATES - SPRAYS**

Type P Pump has 1,001 uses. Up to 3,000 GPH; 450 GPH 90' high; or 1800 GPH from 25' well. Use 1/6 to ¾ HP motor. Coupling included free. 1" inlet; ¾" outlet. Stainless shaft. Won't rust or clog! **Heavy Duty Ball-Bearing Pump.** Up to 7,500 GPH. 1¼" inlet; 1" outlet. **$7.95** **$12.95**

Postpaid if cash with order. Also other sizes, types.
MONEY BACK GUARANTEE.
LABAWCO PUMPS, Belle Mead 3A, N. J.

CELLAR DRAINER "Low Boy" KIT

15½" high. 1500 GPH **$12.95** (less motor)

"High Boy" —32" high. 3,000 GPH. **$15.95** (less motor)

FUN-WORK YARD TRACTOR
WHEEL-HORSE RIDE-AWAY

Sensational low price

Turn work into FUN! Do a dozen back-breaking jobs in a jiffy. Yard-size tractor with 5 forward speeds and 1 reverse. 3½ hp (or 2½ hp) engine. Heavy channel steel chassis. Mow 5-foot swath at 5 mph. Plow snow, cultivate, haul compost, pull any of 22 attaching tools for yard and garden. Write for details, and name of dealer.

WHEEL-HORSE PRODUCTS COMPANY
2651-C Dixieway North **South Bend, Indiana**

SUPERSHOP MAGIC POWER TOOLS

Only $16 each!

5 BIG POWER TOOLS IN ONE
FACTORY TO YOU $79.95

Only SUPERSHOP can offer you a complete precision-built workshop for $16 per tool. 100% Ball Bearing. Lifetime accuracy. Rugged frame of heavy steel tubing. Handles big jobs. 8" saw. Sold direct from factory to save you $65.05. FREE trial. Easy pay plan. Free Catalog.

VERTICAL DRILL PRESS

Write for FREE Catalog

POWER TOOLS INC. **294 YATES AVE. BELOIT, WISCONSIN**

IT'S HERE . . . the ALL-NEW, YEARS-AHEAD *Cushman* **ROAD KING**

Designed for tomorrow body lines in two-tone colors. Ruggedly built. Greater comfort and riding ease. Powered by Cushman Husky 4-cycle engine. Up to 50 miles per hour, up to 100 miles per gallon. Ride it anywhere, everywhere for just ¾ cent per mile.

- Sold and serviced nationally; replacement parts available immediately
- Ask your Cushman dealer for FREE demonstration
- Dealer inquiries invited.

Write for new FREE booklet today

CUSHMAN MOTOR WORKS, INC.
914 No. 21st, Lincoln, Nebraska

Expansion feature of Star Wallgrips enables you to securely fasten all kinds of fixtures (such as mirrors, pictures, cabinets) to hollow plaster walls, wallboard and thin panels of wood or metal—wherever ordinary screws or nails fail to hold.

Star Wallgrips are easy to use. Simply drill a hole, insert a Wallgrip and lock in place with screwdriver. Wallgrips remain secure. Fixtures can be removed quickly, easily for painting or redecorating. Write for FREE copy of "The Hang of Things," which shows how to fasten every kind of fixture to any type of wall.

STAR EXPANSION
142 Liberty Street (Dept. PS)
New York 6, New York

Send me a free copy of your booklet, "The Hang of Things."

Name _____

Address _____

City _____ Zone _____ State _____

STAR WALLGRIPS *are available at hardware stores, chain stores and building supply dealers.*

New 1957 SPORTABOUT CARS and GOLF CARS. Write for literature.

ESHELMAN TRACTORS LOW AS $99

For Better Lawns and Gardens investigate Eshelman Riding Rotary Mowers, Tillers, Tractors. Advertised in GOOD HOUSEKEEPING. Thousands of satisfied users. For Free Literature Write:

Dept. 96, ESHELMAN, Baltimore 2, Md.

McKinney Manufacturing Company
1715 Liverpool Street, Pittsburgh 33, Pennsylvania
Send literature on McKinney Sliding Door Hardware

Name _____

Address _____

City _____ Zone _____ State _____

KING MIDGET

ALL NEW. First model change in six years. New bodies, new chassis, new engine. Four wheel hydraulic brakes. Still World's Lowest Priced Car. Drive it for 75c per week. Rider Agents Wanted. Earn your own car. Get the facts. Send 25c for 32 page picture book with complete details, dealers price etc.

MIDGET MOTORS CORPORATION, Athens 2, Ohio

PRECISION LEVELING GAUGE

ONLY 5.95 P.P.

A Precision Levelling Instrument Makes levelling a one man job. Money back guarantee. For difficult levelling jobs, the levelling indicators attach to any garden hose. When the hose is filled with water, the indicators give an exact check for levelling foundations, batter boards, sills, floors, lawns—any type of construction job. Complete with clamps, hose couplings, slide indicators and check valves. Takes only minutes to operate.

Department PS-2

LEVEL-RITE, Granby, Conn.

10" TILT/ARBOR SAW BUILD-IT-YOURSELF from GIL-BILT KITS-PLANS

Sturdy wood, steel, and aluminum construction. NEW DEPARTURE ball bearings. Capacity and performance of floor saws selling for $150.00 and up. Plans, all metal parts in kit with 10" comb. blade **$25.90**, less blade **$22.95**. F.O.B. St. Louis. Detail PLANS-PATTERNS only $1.00 postpaid.

Build-it-yourself 12" and 18" Bandsaws, 6" Belt Sander, Shaper. Simplified plans, build easily with hand tools only. Advertised and sold for 10 years, over 33 000 units in use. Money back guarantee. FREE CATALOG.

GILLIOM POWER TOOLS, Dept. 70-D, Lambert Field, St. Louis 21, Mo.

NEW! ALOMET* COLD SOLDER

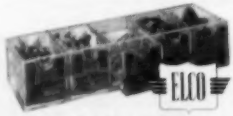
with the miracle ingredient EPOLITE*

NOW—Fix 1001 jobs around garage, home, farm, boat and service station. Absolutely no shrinkage. Also neutral color excellent for cement-on-jewelry, ceramics, pottery and plastics.

ORDER NOW neutral or metallic. 2 oz. Starter kit covers 70 sq. in. $1.25. Jumbo kit—only $2.50.

NO C.O.D.—DEALER INQUIRIES INVITED. *Trademark

© **ALOMET CO. (Div. of National Biochemical Co.)**
3106 WEST LAKE STREET, DEPT. 457, CHICAGO 12, ILL.



5-BOX *DrawerRacks*
STACK WITHOUT SLIPPING OR FASTEN TO WALL
The newest, cleverest, most convenient method of keeping your screws and bolts handy for quick use!

stock your Shop

SCREWS • BOLTS • NUTS

59c PER BOX

Look in your hardware store for the revolving display rack that contains all 40 of the most-wanted types and sizes of screws, bolts, and nuts. You get *generous* quantities in clear plastic boxes, brilliantly labeled for fast, accurate selection. *Start to "Stock your Shop"* today!

ELCO TOOL & SCREW CORP., Rockford, Ill.

THE ORIGINAL
PACKAGED BOAT KITS

Made ONLY by Custom-Craft

Top Performance, Design, Styling! Over 70 Models 8 to 21 ft

World's largest line! Over 200 Boats: Kits, Formed-Hulls, Semi & Custom-finished! All types: Prams -Cruisers! Easy to build! Flying stern, Tredronic bottom, Bulkhead construction!

Send 35¢ for KIT CATALOG

52 pages: Includes Victory Series, hardware, paint accessories, Fiberglas! Send $1.00 for Catalog Plus "Boating Handbook" DEALERS-AGENTS INQUIRE

BOAT PLANS & PATTERNS Frame-Pac Kits

World's largest selection: over 200 plans, full-size patterns, frame-pac kits! Designed strictly for amateurs! All types: prams, kayaks, racers, runabouts, catamarans, houseboats, cruisers - inboard-outboard 6-40' wood-plywood-steel!

Send 35¢ for PLAN CATALOG

Catalog PLUS "Boatbuilding Handbook" $1.00

CUSTOM-CRAFT - BUFFALO 7, N. Y.

SEAL TITE

THE ORIGINATORS OF "Do It Yourself" FURNITURE FINISHING

Offer a complete range of materials for a PROFESSIONAL FINISHING JOB ON UNPAINTED FURNITURE

SEAL-TITE SUPER SPAR A transparent varnish for all surfaces

SEAL-TITE "2 in 1" STAIN AND SEALER Choice of 11 wood shades.

SEAL-TITE CRYSTAL CLEAR FURNITURE FINISH for all wood surfaces

SEAL-TITE SAT-N-TONE CLEAR WOOD INTERIOR FINISH

SEAL-TITE SATIN COTE a semi-gloss clear wood interior finish

SEAL-TITE ROD VARNISH for all wood sports equipment.

SEAL-TITE REDWOOD OIL with or without coloring.

Each available in handy size half pint cans up to one gallon.

NEW "DO IT YOURSELF" WOOD FINISHING KIT. Everything you need in one economical package. (choice of 14 shades) Reg. size **$3.25** ; Large size **$4.25**

At your dealer or order direct—(Dealer Inquiries invited)

SEND FOR FREE LITERATURE

Dept: PS-47

SEAL TITE PRODUCTS CO. 7508 San Fernando Road, Sun Valley, Calif.

GENUINE ALNICO
MAGNETS

AMAZING, PERMANENT, NON-ELECTRIC, HIGHLY PRACTICAL. Conduct interesting experiments. Hundreds of uses. Retrieve valuable steel items such as guns, tackle from fresh or salt water; tools from tanks & drains. **GUARANTEED.** Try any magnet one week Money back if you are not well-pleased.

No. S-710 (Wt. 53 oz.) Has pull of 225 lbs. on steel block		$16.50
No. S-625 (Wt. 70 oz.) Has pull of 125 lbs. on steel block		$ 9.50
No. S-575 (Wt. 18 oz.) Has pull of 75 lbs. on steel block		$ 6.50
No. S-500 (Wt. 13 oz.) Has pull of 50 lbs. on steel block		$ 4.50
No. S-300 Kit of Flat Bars 5 Pairs (10 Magnets)		$ 3.00
No. S-250 Kit of Round Rods 5 Pairs (10 Magnets)		$ 2.50
No. S-47 Hot Pad Magnets. 10 for $1.00	50 for	$ 4.87
No. S-35 Hobbyist assortment of 8 small magnets		$ 1.50

Send M.O. or check. We pay postage. Sorry no C.O.D.'s.

MIAMI MAGNET COMPANY, 3240 N. W. 27th Ave., Miami 42, Fla.

Grips the screw!
Drives it too!

Quick-Wedge
SCREW-HOLDING
SCREWDRIVER

2" to 14" blades, 4 bit sizes
Available with shockproof plastic covered tubing
Unconditionally guaranteed

ASK FOR IT AT YOUR DEALER
Kedman Co., 233 So. 5th W., Salt Lake City

SAVE at PALLEY'S on HOME IMPROVEMENT BARGAINS!

3400 RPM-½ HP POWER SAW
RIPS - CROSSCUTS
CUTS A FINISHED 2x4 LIKE A KNIFE THROUGH BUTTER

COMPARES TO SAWS SELLING UP TO $49.50 **19.98** Complete with 5-1/2" Blade

A rugged, professional type, adjustable saw. Will cut any angle from 0 to 45° Rips on adjustable 0 to 6" rip fence. Safety-trigger switch on handle. Full ½ HP Universal AC-DC, 110-120 Volt, 60 cycle motor. Weighs only 8½ lbs. Thousands already sold. Your satisfaction guaranteed.

NEW EXTRA SAW BLADES — Available in Rip, Crosscut or Combination. Please Specify **2.25 EA.**

NEW **DRILL DRIVEN BAND SAW** **12.88**
Easily driven by any 1/4" electric drill or other similar power source. Has full 10" throat, cuts to center of a 20" board. Table tilts for angle or bevels. Drive pulleys are high impact phenolic and run on oilite bearings. 3/16" saw-steel blade. Die-cast housing and many other fine features. Ideal for "do-it-yourself-ers".

SAVE 50%

PHILIPPINE MAHOGANY LUAN PLYWOOD
For Paneling Dens, Offices, etc. Use in Cabinets, Furniture, etc. Rotary cut. Both sides sanded. Bonded with finest resin adhesive. Face side uncoated. Shipped at lowest rates.

FREE SAMPLE REQUEST

3mm (1/8") x 3FT. x 6 FT. $5.89 VALUE **1.79** PER SHEET MINIMUM ORDER 6 SHEETS

1/4" x 4 FT. x 8 FT. 9.59 VAL. MIN. ORDER 4 SHEETS **4.49** PER SHEET

SAVE 50% ON TRANSLUCENT FIBERGLAS PANELS
Ideal for the home or office and in new construction. Finest quality in many widths and lengths. A variety of colors to suit every taste. Send for a FREE SAMPLE and booklet. Worth 85¢ per sq. ft. ONLY 49¢ SQ. FT.

RS38A MICROPHONE **2.49**
Carbon type with push-to-talk button. Operates with 1½ Volt drycell. Comes with 6ft., 3 conductor shielded cable . . .

HEARING-AID TYPE HS30U HEADSET
Consists of two 250 Ohm receivers on metal headband. Wired with 16" rubber molded yoke and 8", 2-conductor lead. lead with solder lugs. . . ONLY **3.49**

NEW NAVY KNIFE KNIFE **2.98** HOLSTER **1.50**
Dagger design with laminated leather handle. Blade is 6-1/2" long, hollow ground on the cutting edge - double edged for 3-1/2" at the point. Ideal for skinning or hunting knife. Comes in a genuine leather belt holster. Overall length 11".

NEW ILLUMINATED **MAGNIFIER** **3.49**
Has full 5 power magnification with brilliant illumination for precise, clear inspection of any substance or material. Holds two flashlight batteries.
Write TODAY for Pamphlet on Microscopes and other Optical Bargains!

FINEST STEEL BAYONET **2.98**
Genuine infantryman's bayonet. Made of the very finest tool steel. Fluted sides and precision honed edge. Blade length is 17" long but many owners are having them ground to shorter lengths for diving and hunting knives. Comes complete with reinforced leather scabbard.

AIR FORCE SURPLUS CONVERTED NYLON PARACHUTE CAR COVERS
PROTECT YOUR CAR! Goes on easily.
For Ford, Chevy, Plymouth, Nash Rambler, etc. **7.95**
For Dodge, Buick, Chrysler, Cad., & other large makes. . . **8.95**

NEW AIR FORCE 16 POCKET VEST **3.49**
Ideal for Riflemen or the Hunter. Has 16 separate outside pockets for shells, glasses & other accessories. 2 large 11"x 8" inner pockets, a leather holster for gun, knife or tool. Sturdy yet lightweight with tie- straps at back for adjustable fit. A $6.95 Value

AMAZING 396 Pg. CATALOG
SAVE UP TO 85%
NOW! THE LARGEST COLLECTION OF BARGAINS EVER ASSEMBLED in one Catalog!
NEVER BEFORE has such a wide variety of merchandise been offered at prices that equal Palley's!

NATIONALLY ADVERTISED MERCHANDISE - NEW and USED GOVERNMENT SURPLUS - FACTORY CLOSEOUTS and EXCITING IMPORTS!! From all these sources Palley's now bring you items of every description! This fabulous catalog contains Hand and Power Tools for industry as well as the home mechanic, Industrial and Building materials and supplies, Housewares, Clothing, Sporting Goods, Camping Equipment, Cameras, Photo Supplies, Hobby Kits & "Gadgets", Microscopes, Electrical Supplies and motors, A huge selection of Surplus Hydraulic Cylinders, Pumps, Valves, etc., and so many more items its impossible to list them all. You have to see it to believe it!

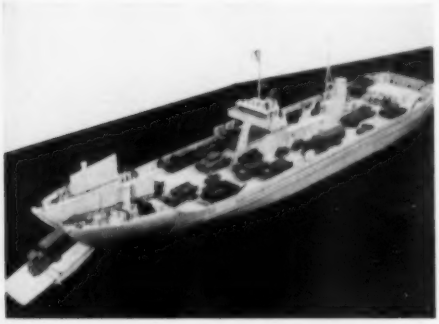
Only 50¢ FOR HANDLING & MAILING — Order Your Copy Today! We refund your 50¢ on your first order of $1.00 or more.

Palley's 3263 S. VERNON AVE. DEPT. PS-4 LOS ANGELES 58, CALIF.

TERMS: Send Check, Cash or Money Order. 50% Deposit with C.O.D.s. Prices F.O.B. Los Angeles, Calif. Warehouse.

Tiny Beacon Rides Rockets

A NEW radar beacon only six inches long (cutaway in drawing) rides rockets and guided missiles to help ground crews track them at greater range and with less interference than with radar echoes. Its receiver-transmitter, power supply and antenna add up to a four-pound package.



Barge Speeds Cargo to Beach

HERE'S the kind of lighter that will catch cargo from the new roll-on-roll-off military transports and run it, at 12 knots, directly to a beach. The model shows the barge with unloading ramp dropped. Carrying load will be 600 tons of vehicles or 1,000 tons of general cargo.

What's Coming in 1958 Cars

[Continued from page 88]

In the works, but still far from the production line:

- A paint that would give all cars coming off the assembly line the same shade, a pastel. Dealers would give the buyer whatever color, or combination of colors, he wanted by "shooting" the paint with an electron gun. A car owner could change colors any time he chose just by revisiting the dealer.
- "Austerity" cars, European style. GM, Ford Motor and Chrysler all have such cars on the drawing boards. But don't look for them unless the bottom falls out of sales on regular models. All three corporations keep looking at the booming sales of the Volkswagen in this country, at the moment more in surprise than apprehension. *If* an austerity car were produced here, it would retail for at least $400 more than a VW because of our higher production costs.

Sensitive to styling changes? 1957 is a safe year to buy a new car. Among the brands that won't change much for the 1958 model year are Buick, Olds, Cadillac, the regular lines of Mercs, Ford, and the entire Chrysler Corp. stable—Plymouth, Dodge, DeSoto, Chrysler and Imperial. Hundreds of millions of dollars were sunk into them for 1957's changes, and the companies have to write off their investments.

One of these cars may undergo a bit more than a face lift. A picture of its rear end hangs in a Chrysler Corp. office, with this legend scribbled underneath: "Suddenly it's 1950." It *does* look a little dowdy. Needless to say, the car competes with Chrysler's.

Ever wonder how far ahead your car was planned? Well, here's the way it is:

The mechanical characteristics of the 1958 cars were determined late in 1955, the styling early in 1956. Tooling for production, which takes 16 to 18 months, was started early in 1956. Hand-built 1958 test cars were running last year. Late this year or early in 1958, Detroit will have a pretty good idea of how its 1960 cars will act and look. END

Now's the time to

trade-in that old saw!

Get an extra big trade-in allowance on a famous Porter-Cable quality saw!

Here's a wonderful opportunity to get any famous Porter-Cable saw illustrated here, at a saving! Trade-in your old saw and get a liberal allowance toward the purchase of a Porter-Cable saw that best fits your cutting needs and requirements. No matter what model you choose, you're getting Porter-Cable quality that can't be beaten for design, construction, versatility and solid value. Check the yellow pages of the telephone book and see these professional quality saws at your Porter-Cable dealer—or use coupon to get complete information. (Offer expires May 31, 1957.)

SAVE $5 ON MODEL 125 SAW!
A standard duty 6" saw featuring Kickproof Clutch, instant depth and bevel adjustments and a safe telescoping guard. List Price $49.50—with *any* saw trade-in . . . . . $44.50.

SAVE $20 ON MODEL 528 SPEEDMATIC!
World's finest professional saw. Big capacity 8¼" blade with new telescoping guard, Kickproof Clutch and many more features. List Price $135—with electric saw trade-in . . . $115.

SAVE $15 ON MODEL 521 SAW!
Famous Speedmatic saw with 7½" blade, Kickproof Clutch, depth and bevel adjustments, and other professional features. List Price $117.50—with electric saw trade-in . . . $102.50.

SAVE $15 ON MODEL 108 SAW!
Rugged 8¼" saw for the builder who needs extra speed and power on all cutting jobs. Features Kickproof Clutch. List Price $99.50—with electric saw trade-in . . . . . $84.50.

SAVE $15 ON MODEL 157 SAW!
Heavy duty 7¼" saw with blade on left. Weighs only 13 lbs. Professional features throughout include exclusive Kickproof Clutch. List Price $95.00—with electric saw trade-in . . . $80.00

SEE YOUR DEALER—OR MAIL COUPON TODAY!

Porter-Cable
Quality Electric Tools

PORTER-CABLE MACHINE CO.
7154 N. Salina St., Syracuse 8, N. Y.

Please send me complete information on your Saw trade-in offer and name of my nearest dealer.

Name_____

Address_____

City_____ Zone____ State____

saws • routers • finishing sanders
belt sanders • drills • planes

In Canada: write Porter-Cable, Ltd., Box 5019, London, Ontario. Canadian prices slightly higher.

More for Your Money

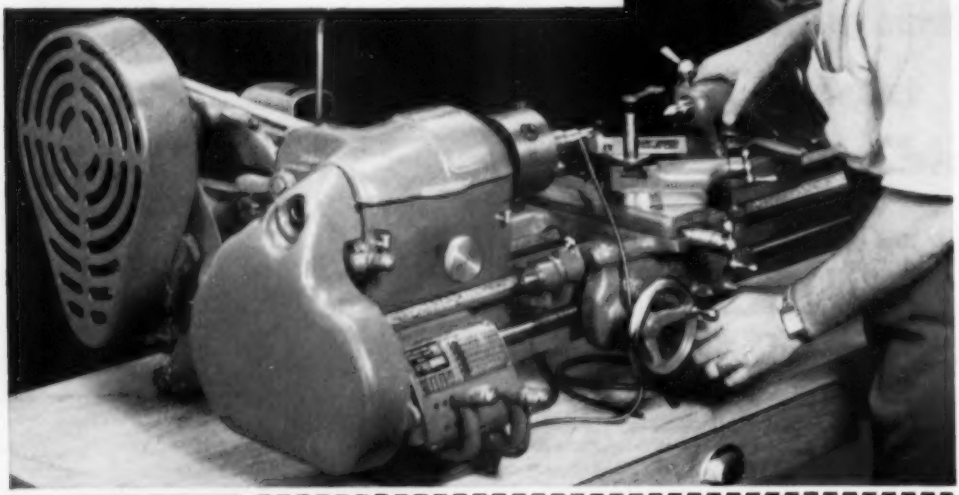
If there is any one reason why South Bend Lathes are so popular it is because they represent the maximum value per dollar of cost. We invite comparison feature-by-feature with any other make, and are confident you will find South Bend gives you more for your money. Send coupon for catalog.

TIME PAYMENTS
only 3¼% interest

Yes, only 3¼% interest per annum on original unpaid balance. Low down payment and balance in up to 24 monthly payments.

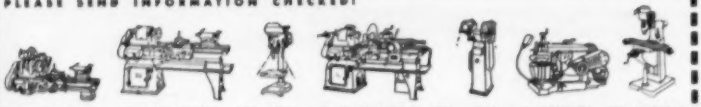
HARDENED BED WAYS

Hardened and precision ground bed ways can be supplied in lieu of regular at small extra cost—also hardened and ground cross-feed screw.



SOUTH BEND

PLEASE SEND INFORMATION CHECKED:



☐ 9" and 10" BENCH LATHES ☐ 10" to 16-24" FLOOR LATHES ☐ DRILL PRESSES ☐ ½" & 1" Collet TURRET LATHES ☐ TOOL GRINDERS ☐ 7" BENCH SHAPERS ☐ MILLING MACHINES

Name _____ Street _____

City _____ State _____

Building Better Tools Since 1906 • **SOUTH BEND LATHE** • South Bend 22, Indiana

Are You Always TOO TIRED AT NIGHT and Too Worried in the Daytime?

DO you come home from work tired out—too exhausted to give your wife and family the real companionship they expect? Does your job take so much out of you that you have no pep and energy when you get home at night?

If you have been experiencing that "run-down, old-before-your-time" feeling . . . if you're usually too tired at night to be the kind of husband and father your wife and family expect . . . science may have discovered the reason: your condition may simply be due to a common and easily corrected nutritional deficiency in your diet.

Yes, you may be *well-fed but poorly nourished.* The food you eat may just not contain the necessary and correct amounts of lipotropic factors, vitamins and minerals to keep you healthy and vigorous. You owe it to yourself and your family to find out whether a safe and proven food supplement such as *Vitasafe* Capsules can restore the pep and energy you'd like to have. And you can find out at *absolutely no cost* by accepting this remarkable offer.

FREE 30 DAYS SUPPLY OF HIGH POTENCY CAPSULES

25 Proven Ingredients—LIPOTROPIC FACTORS: Choline, Inositol, and Methionine—11 Vitamins (including Blood-Building B-12 and Folic Acid), 11 Minerals

EACH DAILY C. F. CAPSULE CONTAINS:

Choline Bitartrate	31.4 mg.	Vitamin B2	2.5 mg.	Iron	30 mg.
Inositol	15 mg.	Vitamin B6	0.5 mg.	Cobalt	0.04 mg.
dl-Methionine	10 mg.	Vitamin B12	1 mcg.	Copper	0.45 mg.
Vitamin A	12,500 USP Units	Niacin Amide	40 mg.	Manganese	0.5 mg.
Vitamin D	1,000 USP Units	Calcium Pantothenate	4 mg.	Molybdenum	0.1 mg.
Vitamin C	75 mg.	Vitamin E	2 I.U.	Iodine	0.075 mg
Vitamin B1	5 mg.	Folic Acid	0.5 mg.	Potassium	2 mg.
		Calcium	75 mg.	Zinc	0.5 mg.
		Phosphorus	58 mg.	Magnesium	3 mg.

COMPARE THIS FORMULA WITH ANY OTHER!

To prove to you the remarkable advantages of the Vitasafe Plan . . . we will send you, without charge, a 30-day free supply of high-potency VITASAFE C. F. CAPSULES so you can discover for yourself how much healthier, happier and peppier you may feel after a few days' trial. Just one of these capsules each day supplies your body with over *twice* the minimum adult daily requirement of Vitamins A, C and D—*five times* the minimum adult daily requirement of Vitamin B-1 and the *full* concentration recommended by the National Research Council for the other four important vitamins! Each capsule contains the amazing Vitamin B-12, one of the most remarkably potent nutrients science has yet discovered—a vitamin that actually helps strengthen your blood and nourish your body organs.

POTENCY AND PURITY GUARANTEED

There is no mystery to vitamin potency. As you probably know, the U. S. Government strictly controls each vitamin manufacturer and requires the exact quantity of each vitamin and mineral to be clearly stated on the label. This means that the purity of each ingredient, and the sanitary conditions of manufacture are carefully controlled for your protection! And it means that when you use VITASAFE C. F. CAPSULES you can be *sure* you're getting exactly what the label states . . . and that you're getting *pure* ingredients whose beneficial effects have been proven time and time again!

DETACH HERE AND MAIL TODAY—NO POSTAGE NEEDED

VITASAFE CORP., 275-2
43 West 61st Street, New York 23, N. Y.

Please send me free a 30-day supply of the proven VITASAFE CF (Comprehensive Formula) Capsules, and full information about the VITASAFE plan. I am not under any obligation to buy any additional vitamins, and after trying my free sample supply, I may accept the benefits and substantial savings offered by the VITASAFE Plan, or if not fully satisfied will reject them. In any case, the trial month's supply of 30 VITASAFE Capsules is mine to use free.

Name .....

Address .....

City ..... Zone ..... State .....

This offer is limited to those who have never before taken advantage of this generous trial. Only one trial supply per family.

DETACH HERE

AMAZING NEW PLAN SLASHES VITAMIN PRICES IN HALF!

With your free vitamins you will also receive complete details of an amazing new plan that provides you regularly with all the vitamins and minerals you will need. This Plan actually enables you to receive a 30-day supply of vitamins every month regularly, safely and factory fresh for exactly $2.00—or 60% lower than the usual retail price. BUT YOU DO NOT HAVE TO DECIDE NOW—you are under no obligation to buy anything from us whatsoever. To get your free 30-day supply and learn all about this amazing new Plan, be sure to send us the postcard today—the supply is limited.

VITASAFE CORP., 43 West 61st St., New York 23, N. Y.

Want Extra Pep and Energy Fast?

MAIL POSTCARD

for FREE

30-DAY SUPPLY HIGH-POTENCY CAPSULES TODAY!

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD

First Class Permit No. 10083—New York, N.Y.

VITASAFE CORPORATION

43 West 61st St.,

New York 23, N. Y.

Postage Will be Paid by Addressee

"Sunday drivers" never had it so good!

SUNDAY DRIVING IS FUN AGAIN! A happy refuge from crowded highways awaits you with an Evinrude. Quietly, swiftly it takes you into the enchanted world of sun and spray and cool blue waters. So much to see, so much to do—cruising—skiing—picnicking on secluded beaches. All so easy, so inexpensive to enjoy!

Whatever your choice of boating fun, there's an Evinrude to match it . . . *most fun afloat* in every power class. Nine superb models for '57. Thrilling new high-performance 18 and 35 horsepower models that set new standards of big-load capability. New 12-volt electric starting. New high duty generator system. New fuel economy. A magnificently styled new Lark model.

SEE YOUR EVINRUDE DEALER—He will gladly help you choose the right Evinrude for any type of boat. Time payments available. For big full-color catalog of the complete Evinrude line, write EVINRUDE MOTORS, 4417 N. 27th St., Milwaukee 16, Wis.

Find Your Nearest Dealer in the 'Yellow Pages'

A Division of Outboard Marine Corporation
In Canada: Mfd. by Evinrude Motors, Peterborough

Evinrude
quiet outboard motors